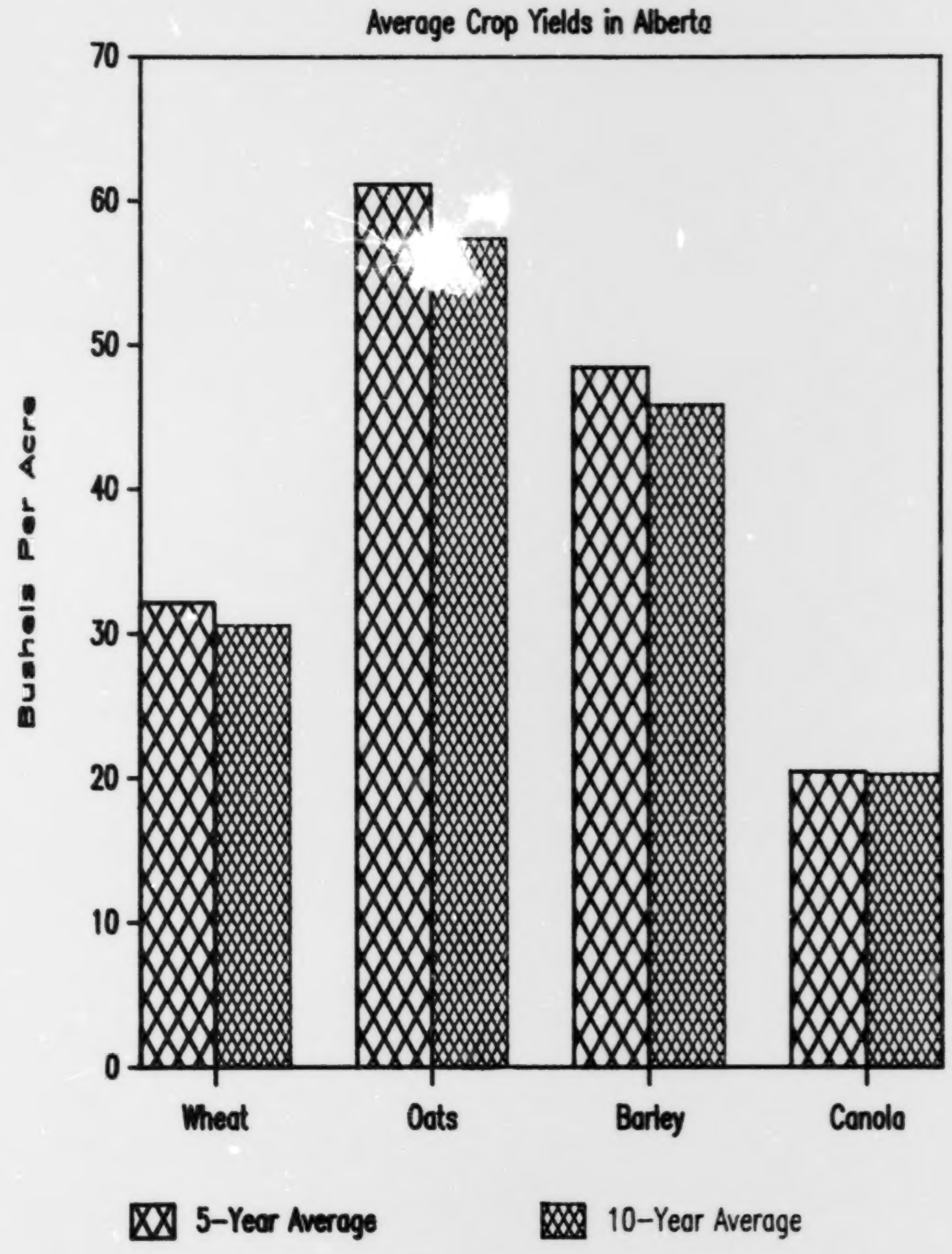
A Graphical Analysis of Crop Yields

Alberta, 1974–84



Alberta
AGRICULTURE
STATISTICS BRANCH

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ALBERTA CROP YIELD STUDY

Purpose

For many years, crop yield statistics have been gathered by organizations concerned with agricultural production on the Prairies. The organizations conduct their research largely independent of others, employing different methods of data collection, organization and presentation.

This report presents crop yield estimate statistics from three sources for the purposes of 1) comparison, and 2) providing a possible range of yields for a particular area and crop. Any inferences drawn from the graphs or data analysis should not be interpreted as our support or criticism of the organization's yield estimates. Differences in collection of data, organization into regions and presentation of the yield data make direct comparisons difficult.

This report includes the crop yield statistics from three sources, Alberta Agriculture Crop Report Questionnaires, The Canadian Wheat Board elevator agent surveys and Statistics Canada releases. Raw, unpublished data have been obtained from Statistics Branch of Alberta Agriculture and the Canadian Wheat Board. Final annual estimates have been obtained from Statistics Canada. Reorganization of much of the raw data has been necessary to allow for comparison. Graphs have been used to illustrate the data of the three sources.

As well as calculating the mean crop yields from the raw data, the number of reports per region and the coefficient of variation (CV) have been provided. The CV indicates the standard deviation of the reports collected per region as a percentage of the mean for the population. A higher percentage indicates there is more dispersion in the yield estimates provided for the region. The degree of homogeneity in crop yield estimates reflects how effectively the province has been divided into crop regions. Readers can form their own conclusions on what yield estimates to use by directly examining the CVs and number of reports.

The province has been divided into districts for which crop yield estimates are derived. Alberta Agriculture has divided the province into six Regions: Southern, South Central, North Central, North East, North West and Peace River. Agriculture Canada and Statistics Canada depict provincial divisions in two ways: 1) Agricultural Reporting Areas - ARAs, of which there are seven; and 2) Census Divisions - CDs, of which there are fifteen. For the purpose of crop yield estimates, CD 9 has been left out because it is not a large producing area. Maps outlining these regional breakdowns are shown on the following pages.

The average number of reports received per region should be weighed against the CV percentage to judge which division provides the best estimate for a particular crop. From a statistical standpoint, a small number of reports generally does not give a good representation of the population. Ideally, an area with a large number of reports and a small CV percentage is the more accurate representation.

Also included in this report are four-year averages of the yield, CV and number of reports for Alberta Agriculture crop data. Eleven-year averages are provided for CWB regional data.

This report has attempted to utilize yield information from three sources. In so doing, several problems arose. Alberta Agriculture data was generally insufficient to generate small area (CD) estimates. As well, Alberta Agriculture data was only available for the period from 1981 to 1984. Statistics Canada information was available on a Census

Division or Agricultural Reporting Area basis only, and thus did not lend itself to Regional comparison. Aside from the obvious data limitations, this report provides a comprehensive set of graphs on crop yields based on all of the data that is currently available.

Outline

This study is presented in the sequence discussed below.

Section I presents yield data previously released by Statistics Canada and Statistics Branch, Alberta Agriculture. ARA and CD breakdowns are both used, depending on the crop.

Section II presents raw and unchecked data collected by the Canadian Wheat Board through elevator agent surveys over the last 11 years. Also included are 4-year averages (1981 - 1984) of the yield, coefficient of variation and sample size (reports). The raw data obtained from the Board has been sorted by Region, ARA and CD.

Section III presents the data from Alberta Agriculture Crop Report Questionnaires in ARA and Regional form. Yield estimates are presented for 4 separate years followed by a 4-year average of the yield, CV and number of reports.

Section IV presents the 4-year averages of both the CWB and Alberta Agriculture data to allow direct comparison.

Section V provides an 11-year average of the yield, CV and number of reports for CWB data, 1974 - 1984.

Brief summaries of each section are presented on the "b" side of the blue section heading sheets throughout this report.

Statistics Branch of Alberta Agriculture welcomes any comments the reader may wish to make on this publication. Data used to compile graphs contained in this report can be obtained on request.

Further information on this report may be obtained
by contacting the authors.

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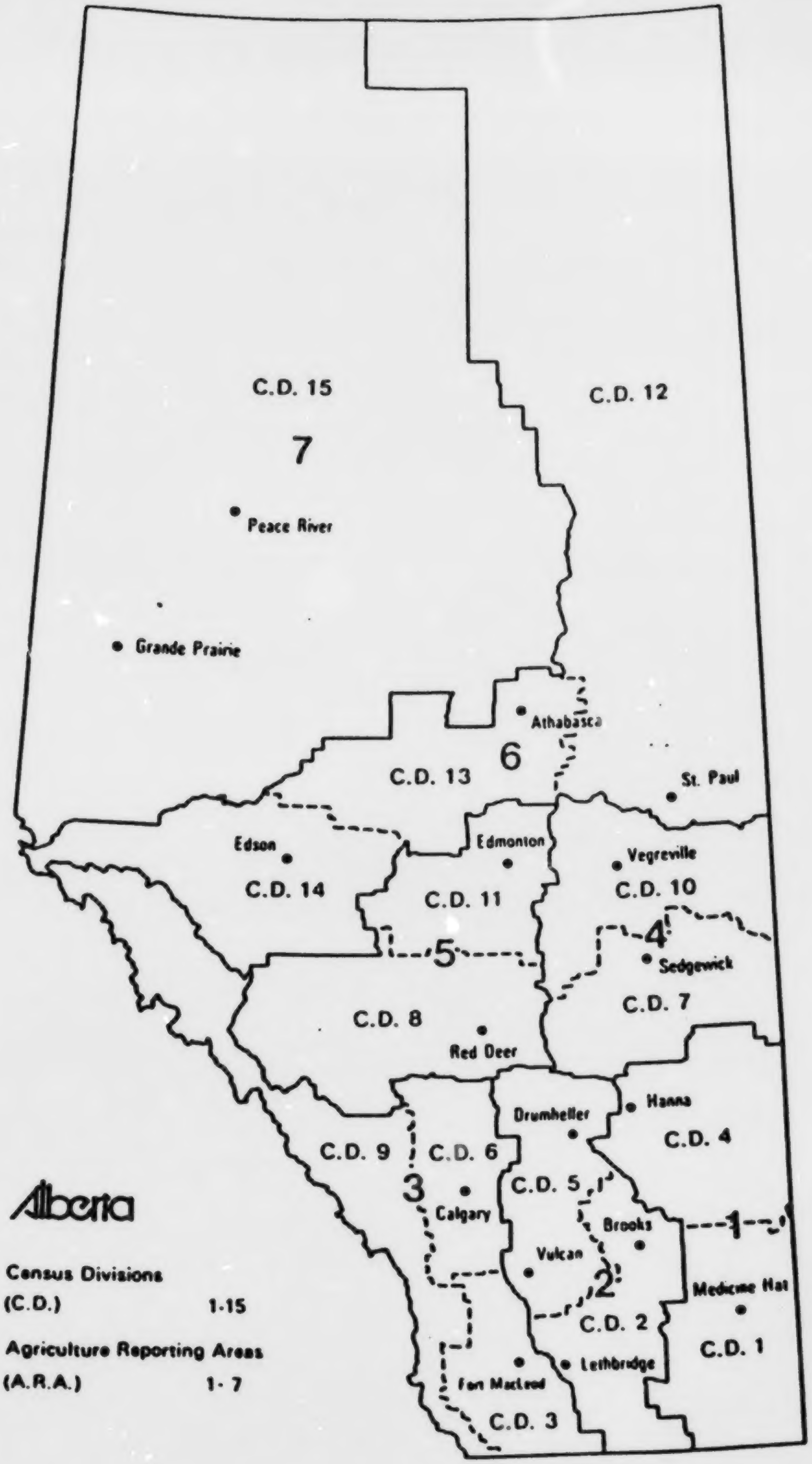
Crop Statistician
427-4011

KENT RACHER
Research Assistant


C.D. 15
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Grande Prairie
C.D. 12
Athabasca
6
C.D. 13
St. Paul
Edson
C.D. 14
Edmonton
C.D. 11
Vegreville
C.D. 10
4
Sedgewick
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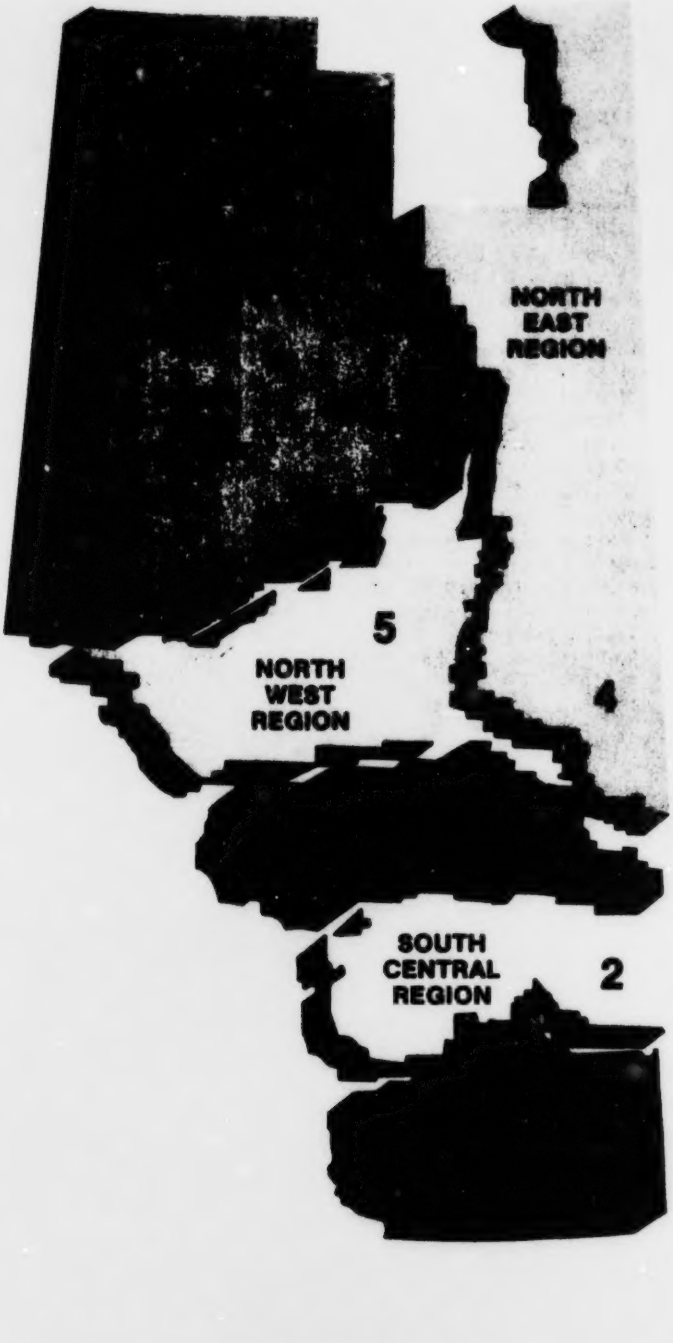
C.D. 7
C.D. 8
Red Deer
Hanna
Drumheller
C.D. 4
C.D. 9
C.D. 6
3
Calgary
C.D. 5
Brooks
1
Vulcan
2
Medicine Hat
C.D. 2
C.D. 1
Lethbridge
Fort MacLeod
C.D. 3
Alberta
Census Divisions
(C.D.) 1-15
Agriculture Reporting Areas
(A.R.A.) 1- 7


NORTH
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CENTRAL
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Alberta Agriculture's Extension Regions

I. Yield Estimates for Major Crops in Alberta Based on Statistics Canada Data, 1974 - 1984, by CD, ARA

Section I Highlights

Crop yields vary considerably from year to year and area to area. Recent dry conditions experienced through much of southern and central Alberta have resulted in declining wheat yields in Census Divisions (CDs) 2, 3, 5 and 6 & 9 (combined) for the past three years. (See map on p. vi.) Most other areas showed yield declines in 1984 relative to 1983. The exceptions were CDs 10, 11 and 13 & 14 (combined), where precipitation generally is not such a limiting factor to crop production. In these areas, wheat yields were higher in 1984 than 1983.

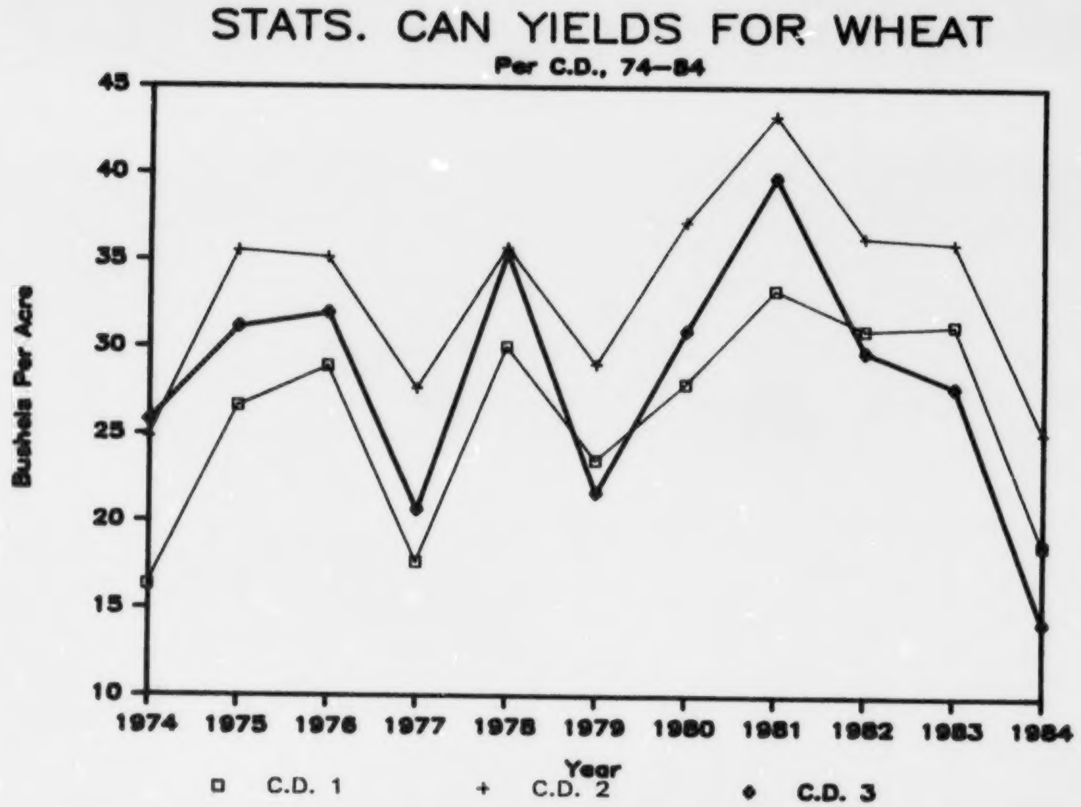
Oats yields have also shown a steady decline in several areas over the past three years, including CDs 1, 2, 3, 5 and 6 & 9. CDs 10, 11 and 13 & 14 showed higher oats yields in 1984 than in 1983.

Barley yields have followed a similar pattern to oats in recent years, with the same general areas showing declines and increases since 1981.

Canola yields, provided by Agricultural Reporting Area (ARA), have declined considerably for three consecutive years in southern Alberta. Other areas have tended to be more stable for canola production recently, with yield increases reported in ARAs 4B, 5 and 6 in 1984.

Rye and flaxseed yields also follow patterns similar to the other crops mentioned above. Recent dry conditions have resulted in yield declines throughout southern districts while other more central regions have shown increases.

The yield declines faced in dry southern districts are not at historic lows. In many cases, lower yields than those experienced in 1984 can be found by examining the 11 years of data presented in the graphs in this section.


STATS. CAN YIELDS FOR WHEAT
Per C.D., 74–84
Bushels Per Acre
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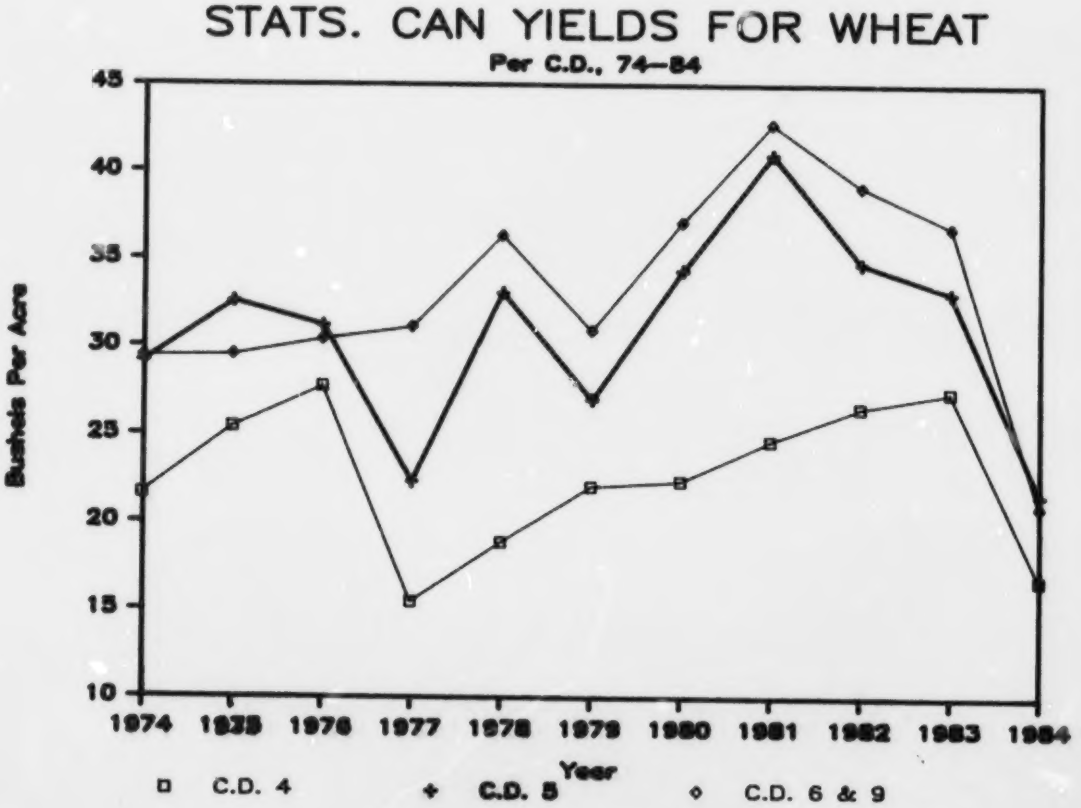
C.D. 1
C.D. 2
C.D. 3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Bushels Per Acre
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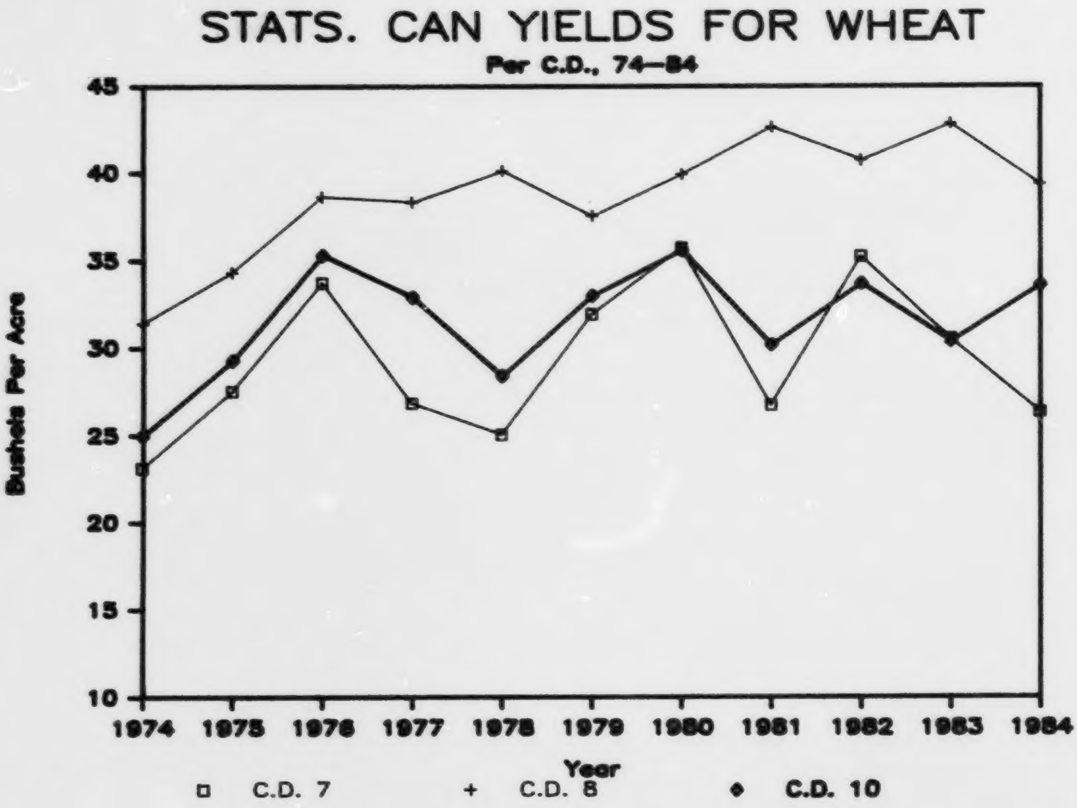
C.D. 5
C.D. 6 & 9


STATS. CAN YIELDS FOR WHEAT
Per C.D., 74—84
Bushels Per Acre
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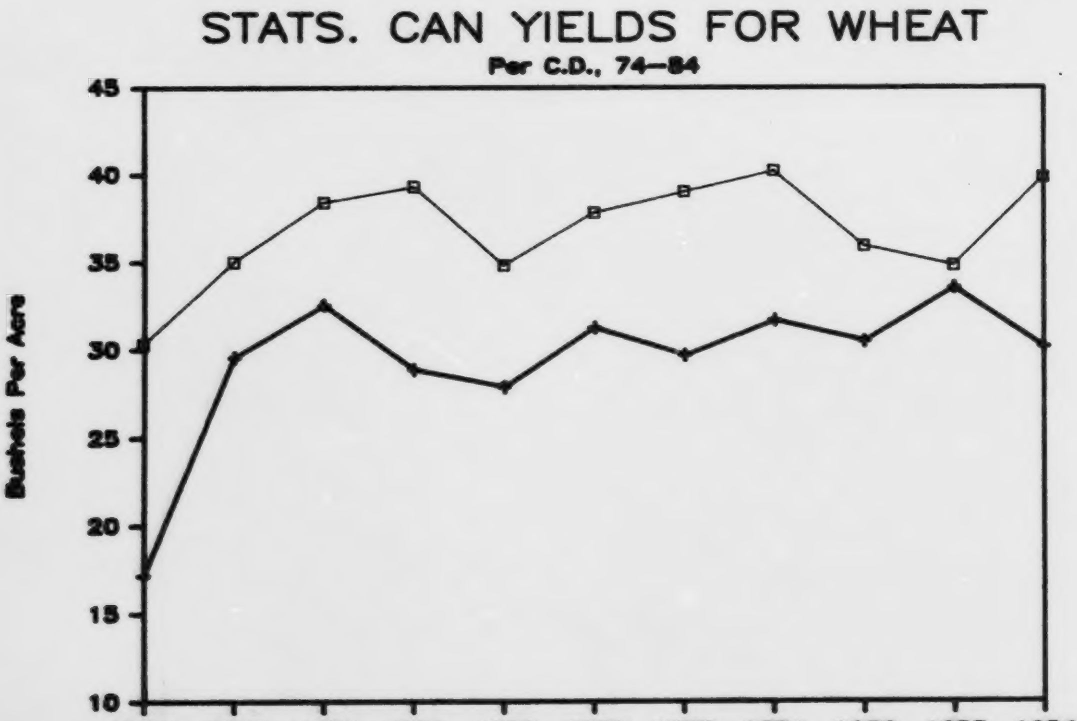
□ C.D. 7
+ C.D. 8
◆ C.D. 10


STATS. CAN YIELDS FOR WHEAT
Per C.D., 74—84
Bushels Per Acre
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Year
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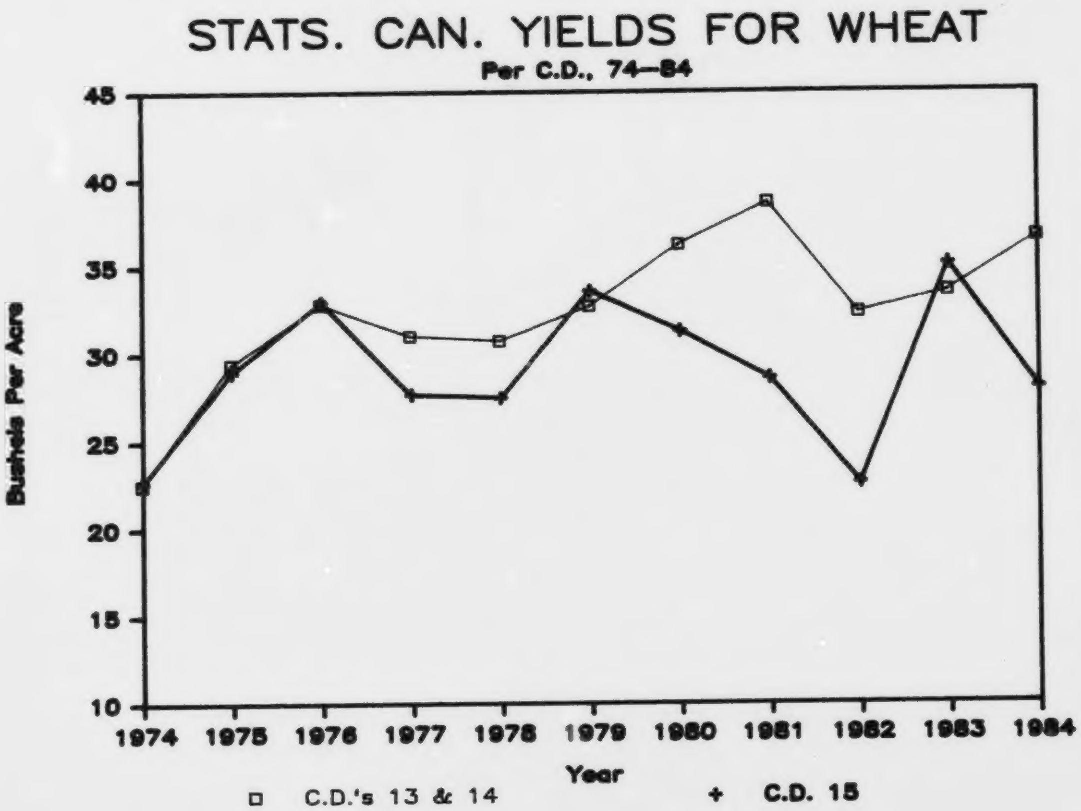
+ C.D. 12



STATS. CAN. YIELDS FOR WHEAT
Per C.D., 74–84
Bushels Per Acre
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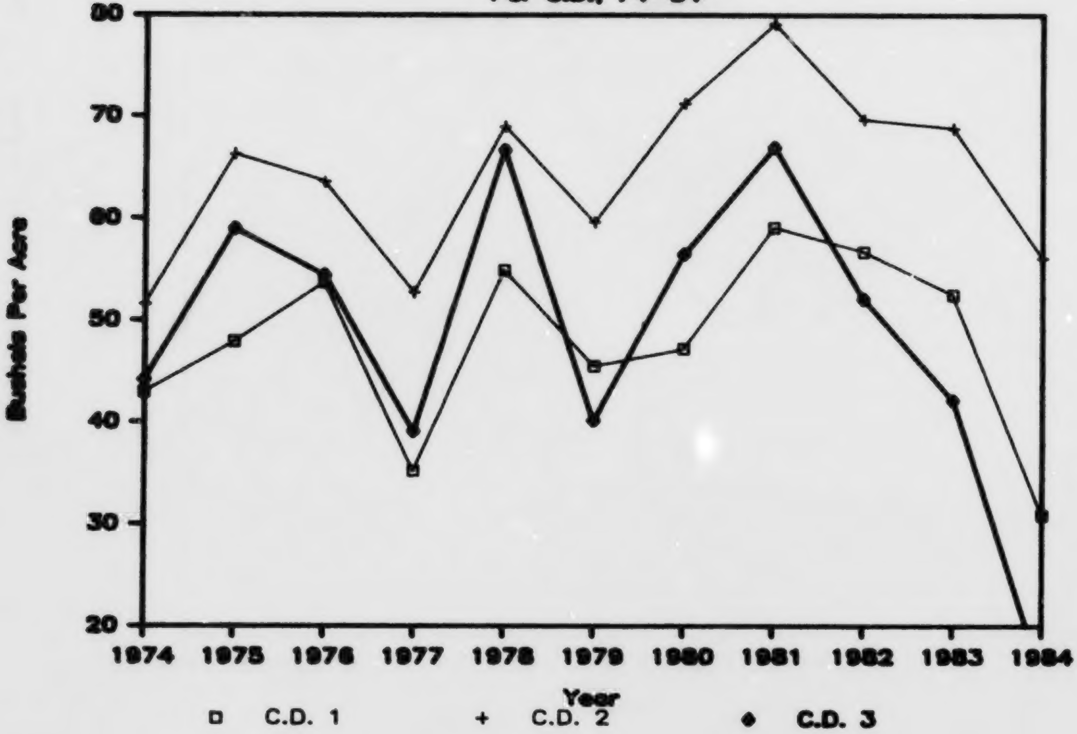
1984
Year
□ C.D.'s 13 & 14
+ C.D. 15

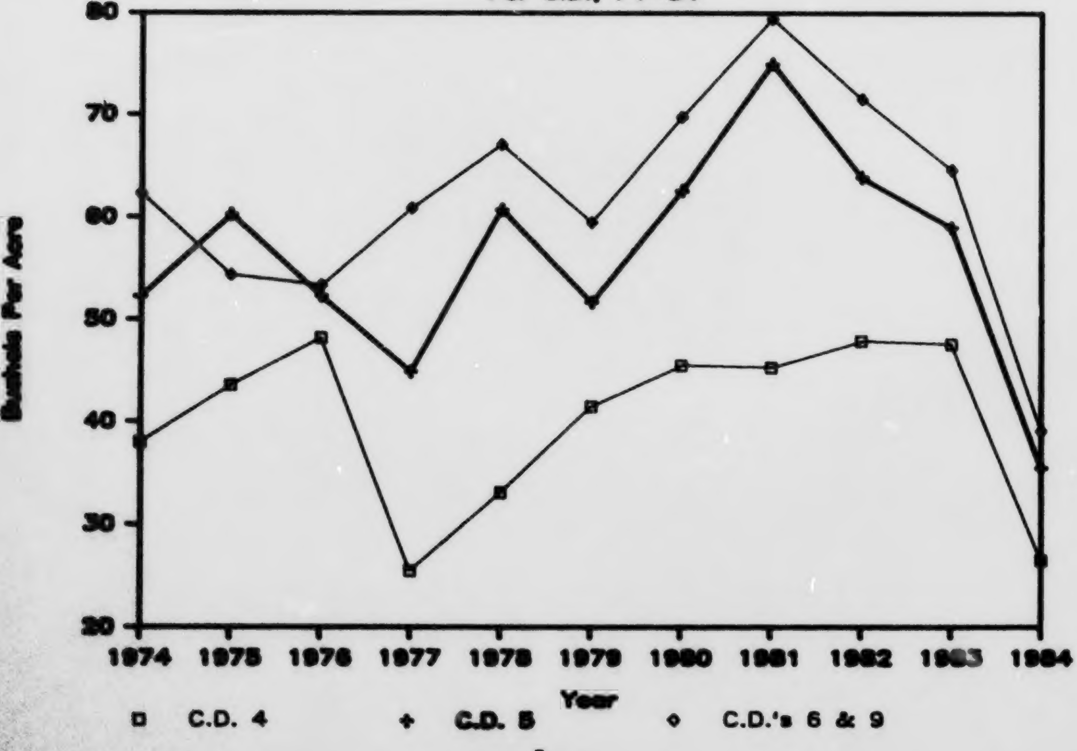
STATS. CAN. YIELDS FOR OATS

Per C.D., 74-84



STATS. CAN. YIELDS FOR OATS

Per C.D., 74-84



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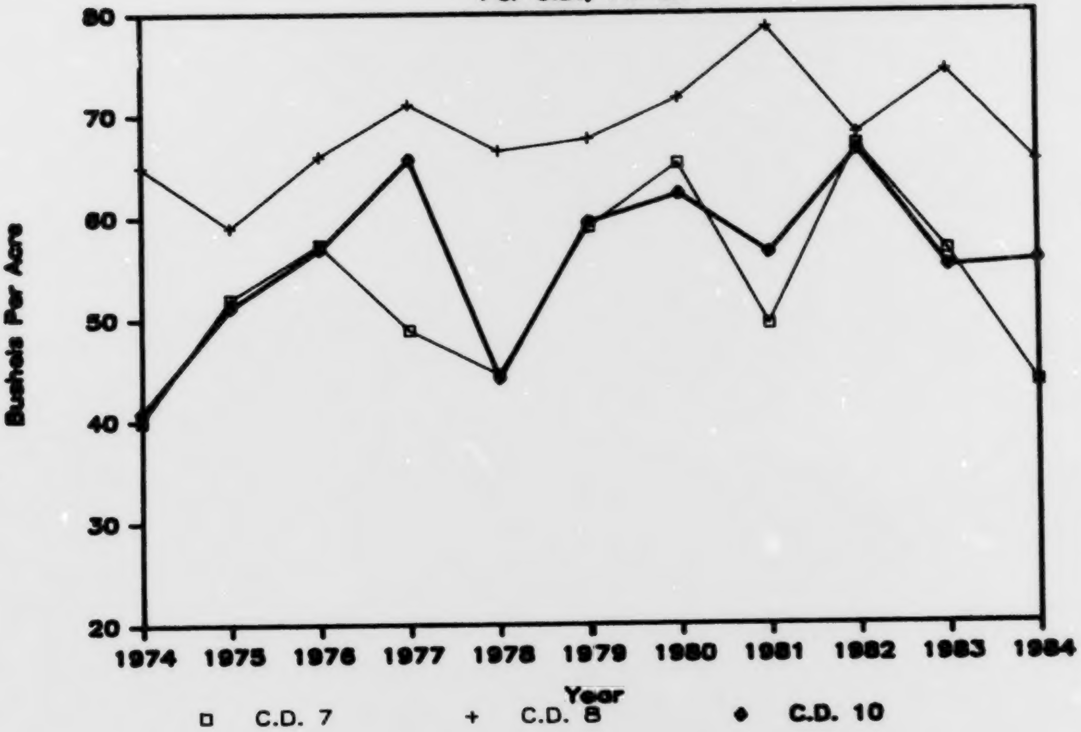
Per C.D., 74–84



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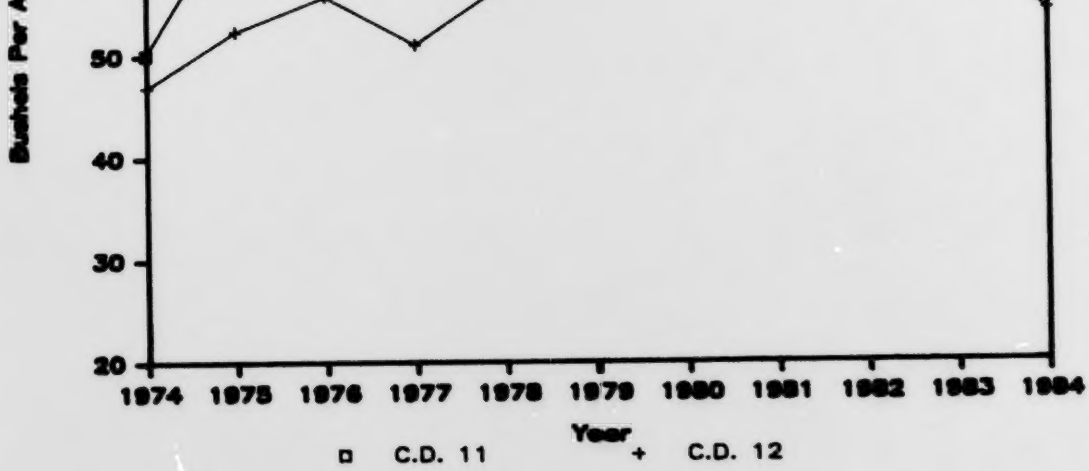
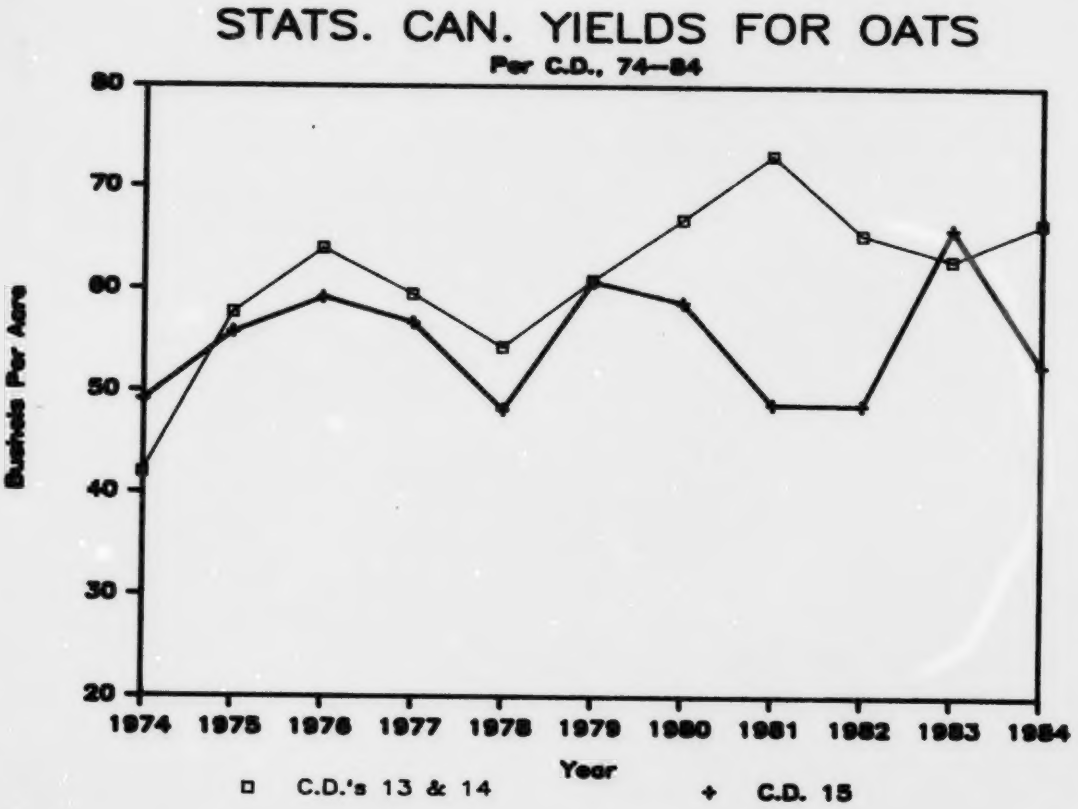
Per C.D., 74–84



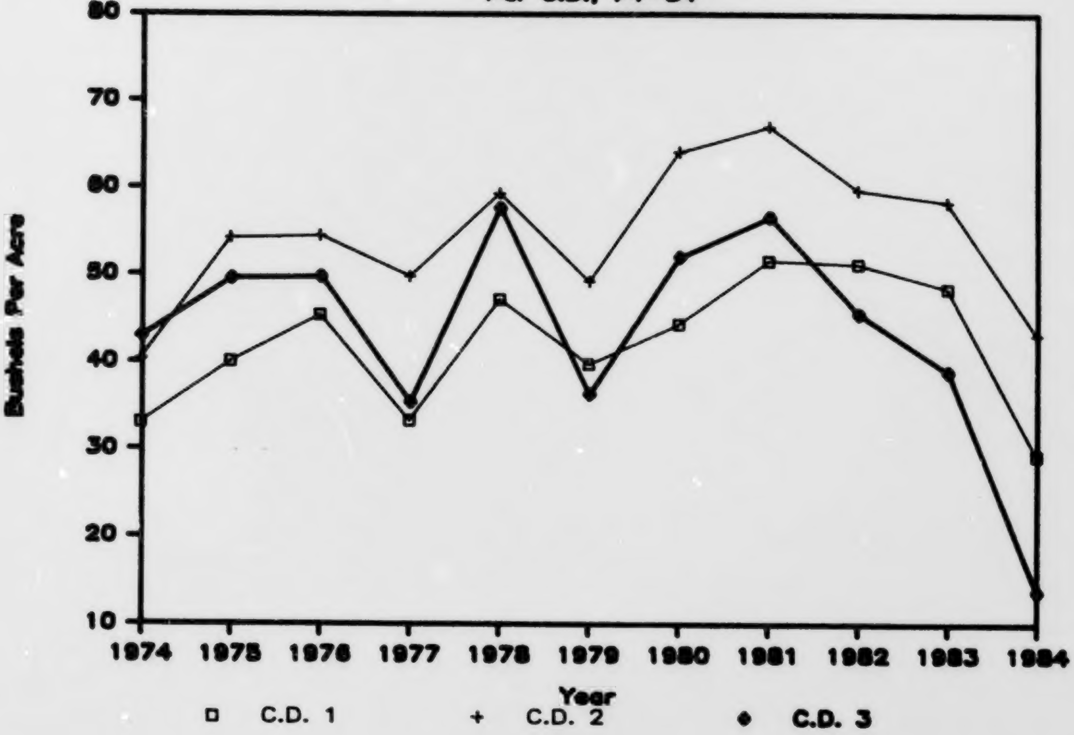


STATS. CAN. YIELDS FOR OATS

Per C.D., 74–84

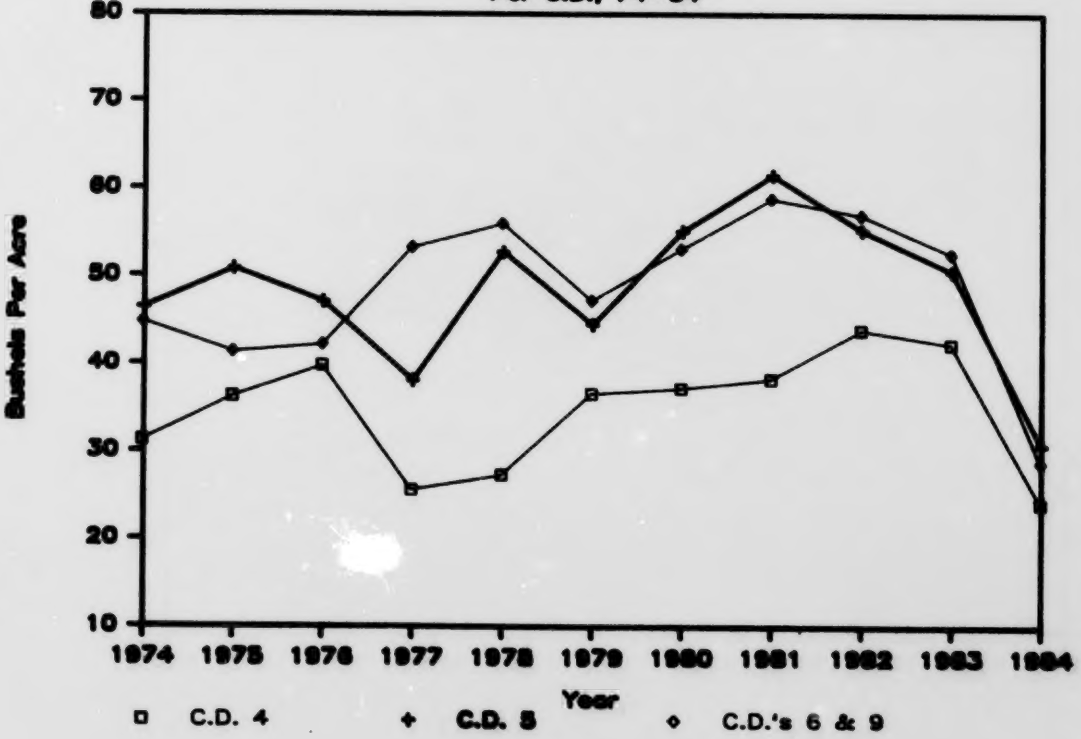
STATS. CAN. YIELDS FOR BARLEY

Per C.D., 74–84



STATS. CAN. YIELDS FOR BARLEY

Per C.D., 74–84



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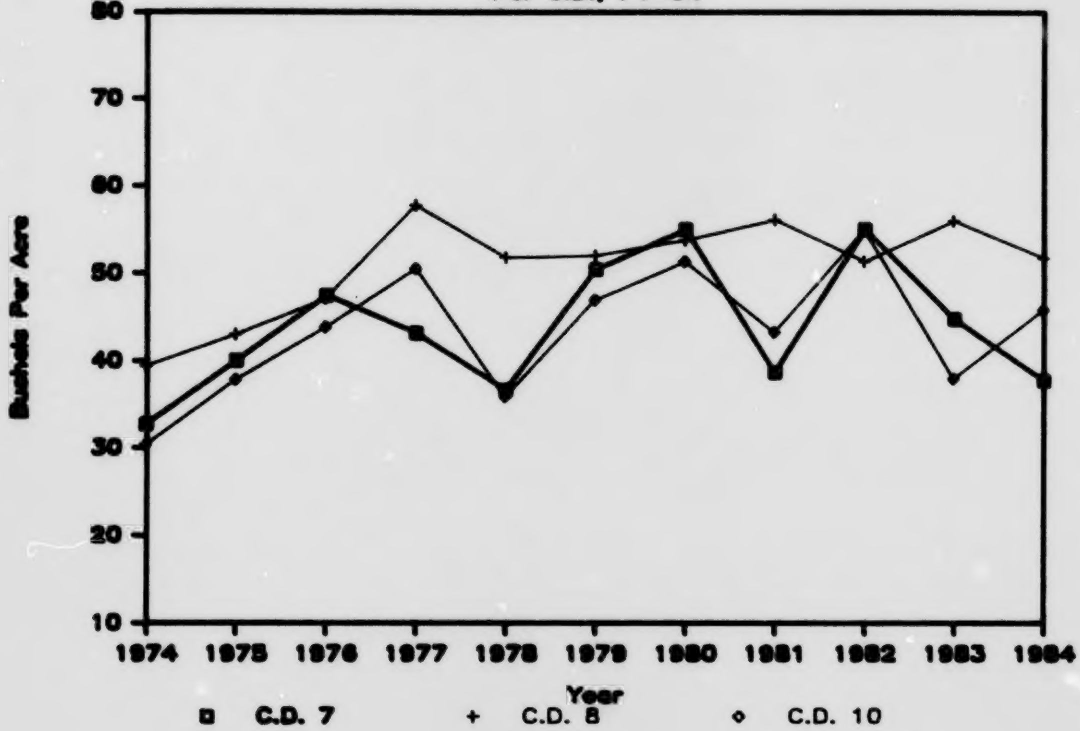
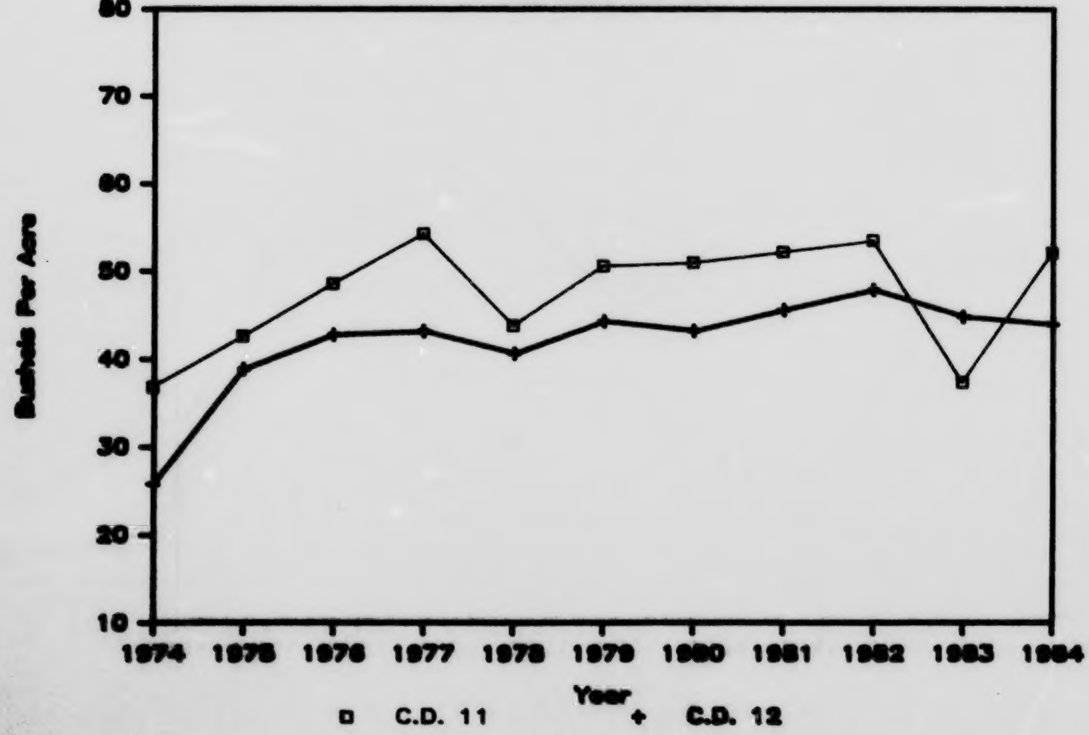
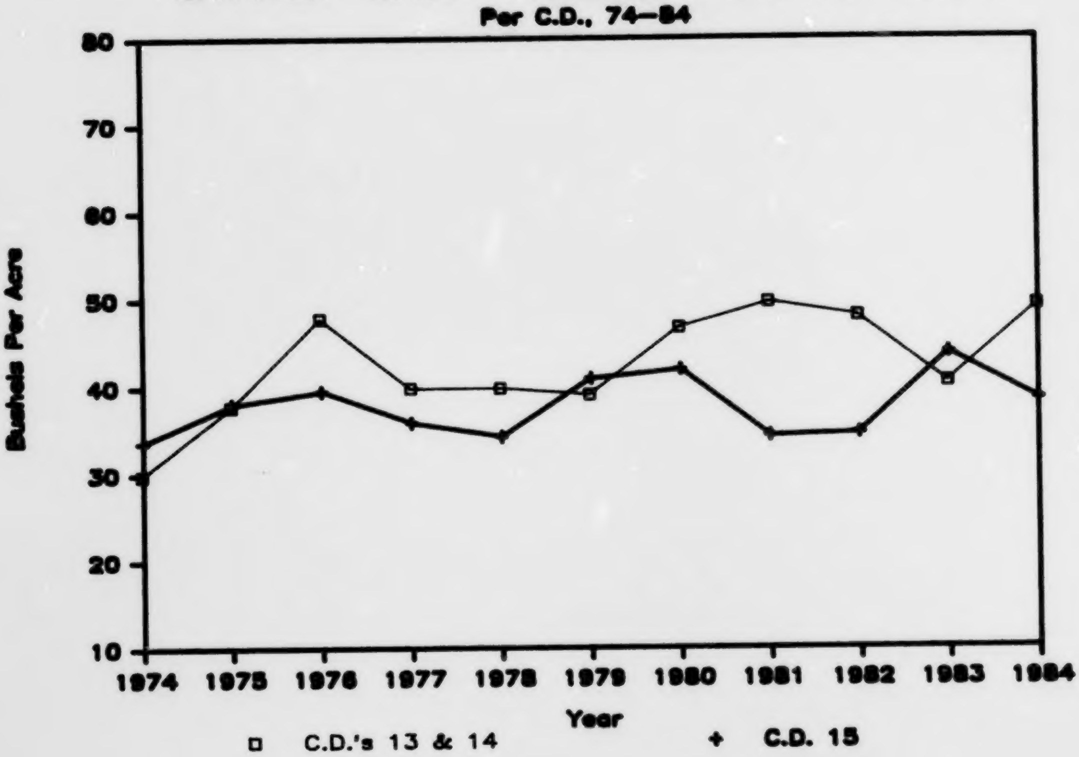
Per C.D., 74–84

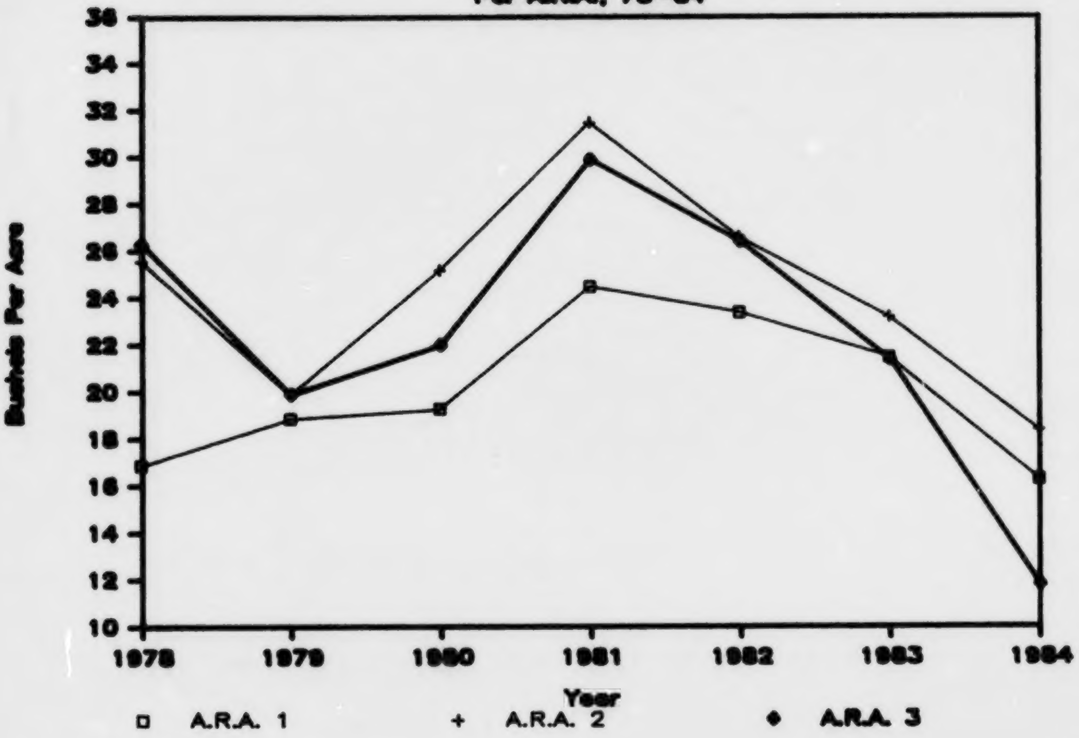


STATS. CAN. YIELDS FOR BARLEY
Per C.D., 74–84



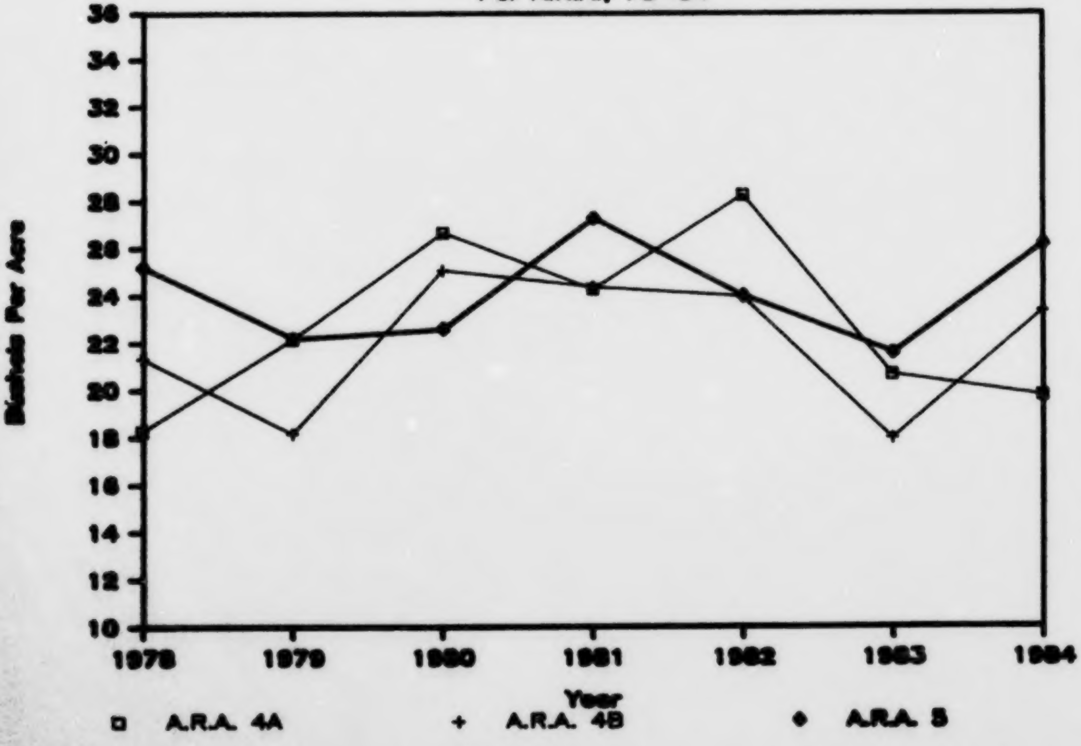

STATS. CAN. YIELDS FOR BARLEY

Per C.D., 74–84



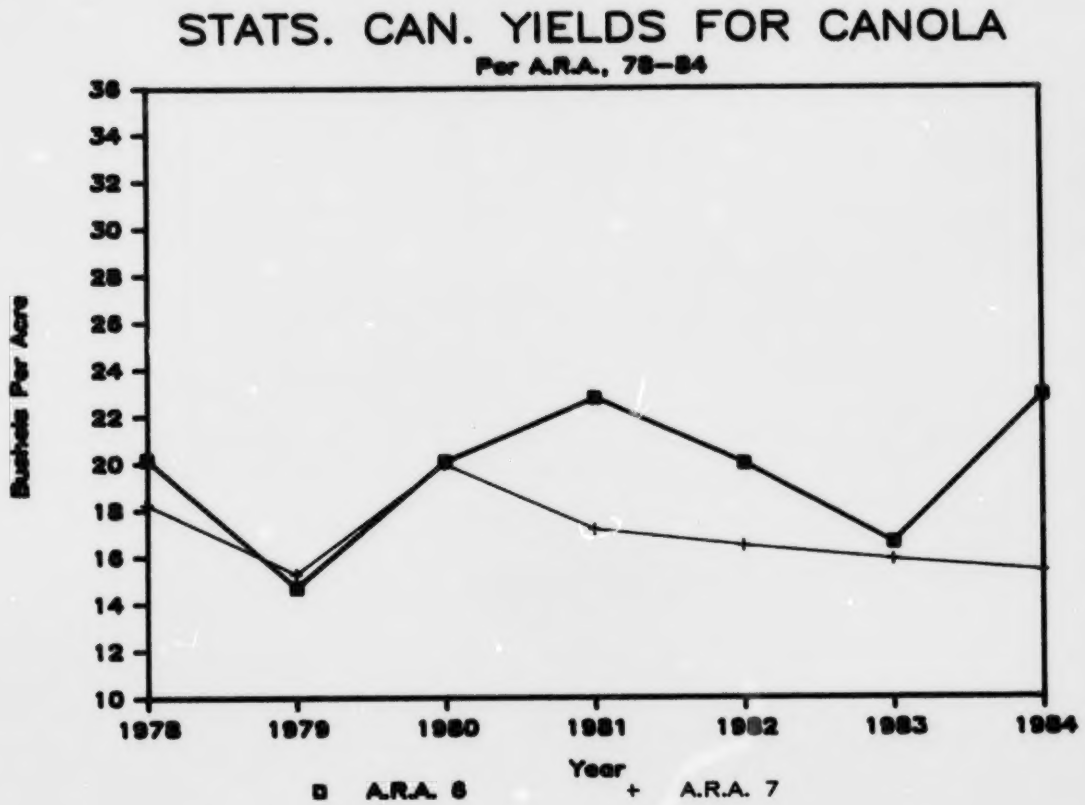
STATS. CAN. YIELDS FOR CANOLA

Per A.R.A., 78–84



STATS. CAN. YIELDS FOR CANOLA

Per A.R.A., 78–84


STATS. CAN. YIELDS FOR CANOLA
Per A.R.A., 78–84
Bushels Per Acre
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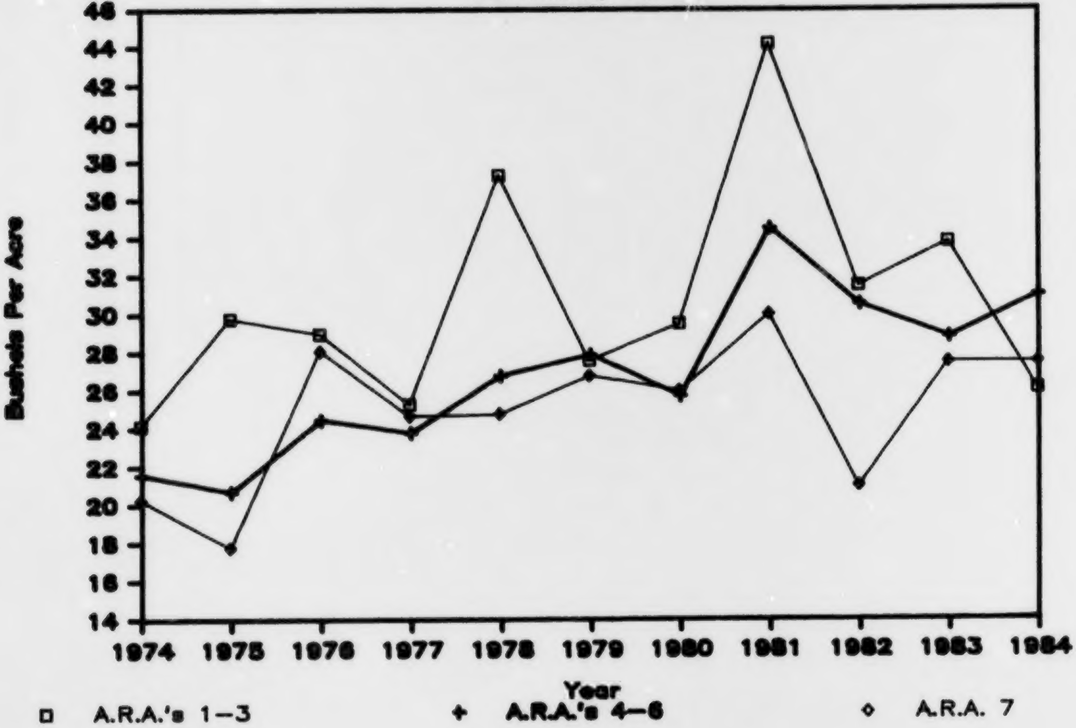
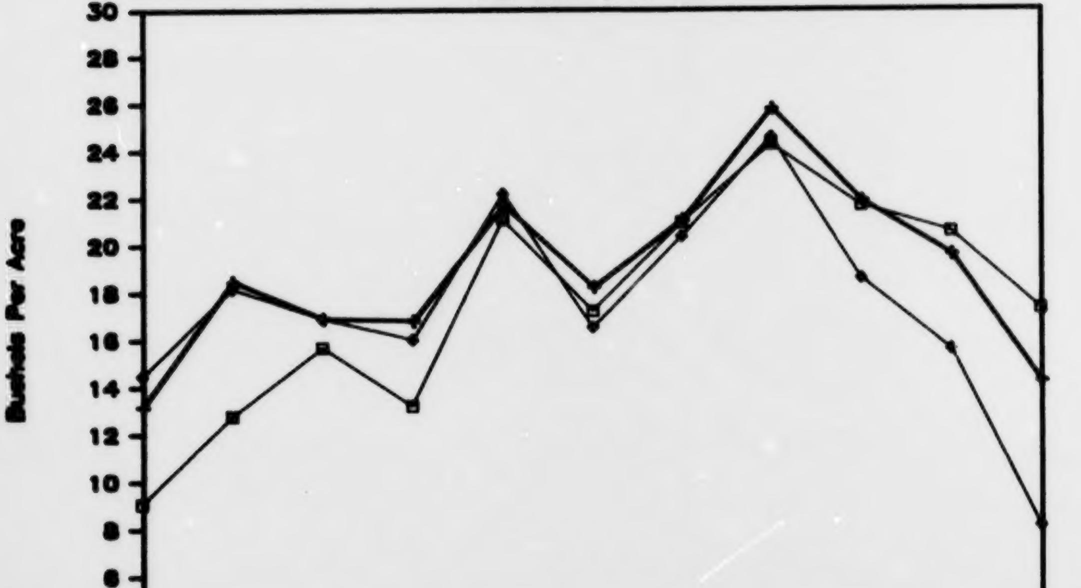
Year
□ A.R.A. 6
+ A.R.A. 7



STATS. CAN. YIELDS FOR RYE

Per A.R.A., 74–84

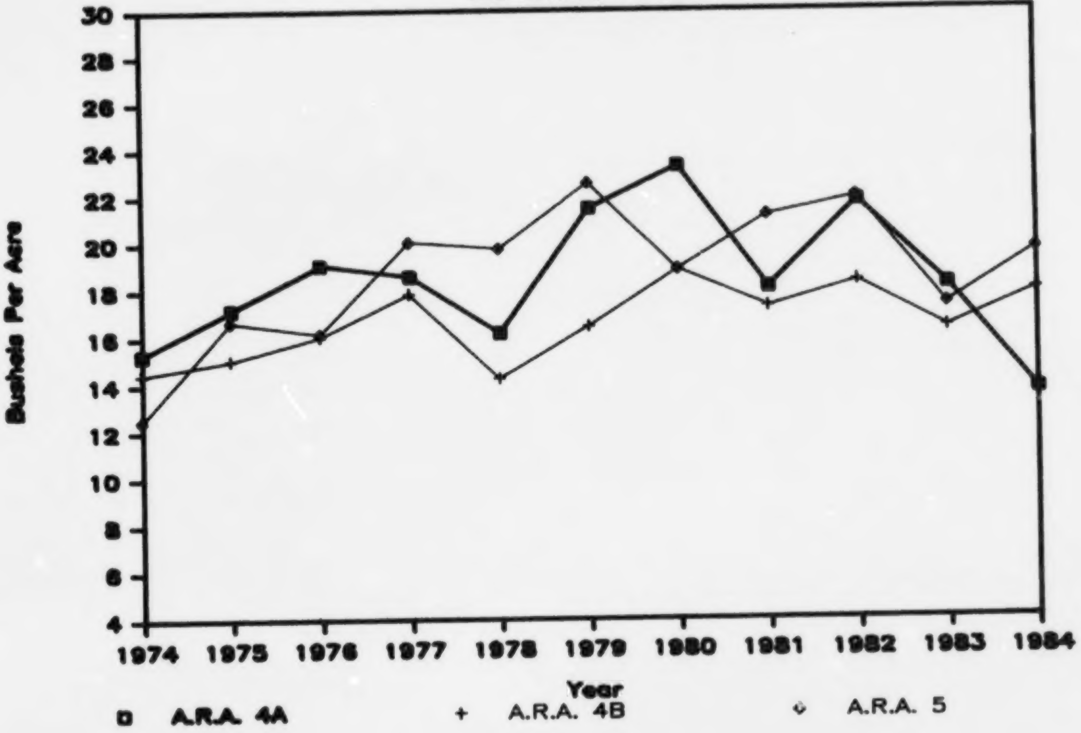


STATS. CAN. YIELDS FOR FLAXSEED

Per A.R.A., 74–84

STATS. CAN. YIELDS FOR FLAXSEED

Per A.R.A., 74–84



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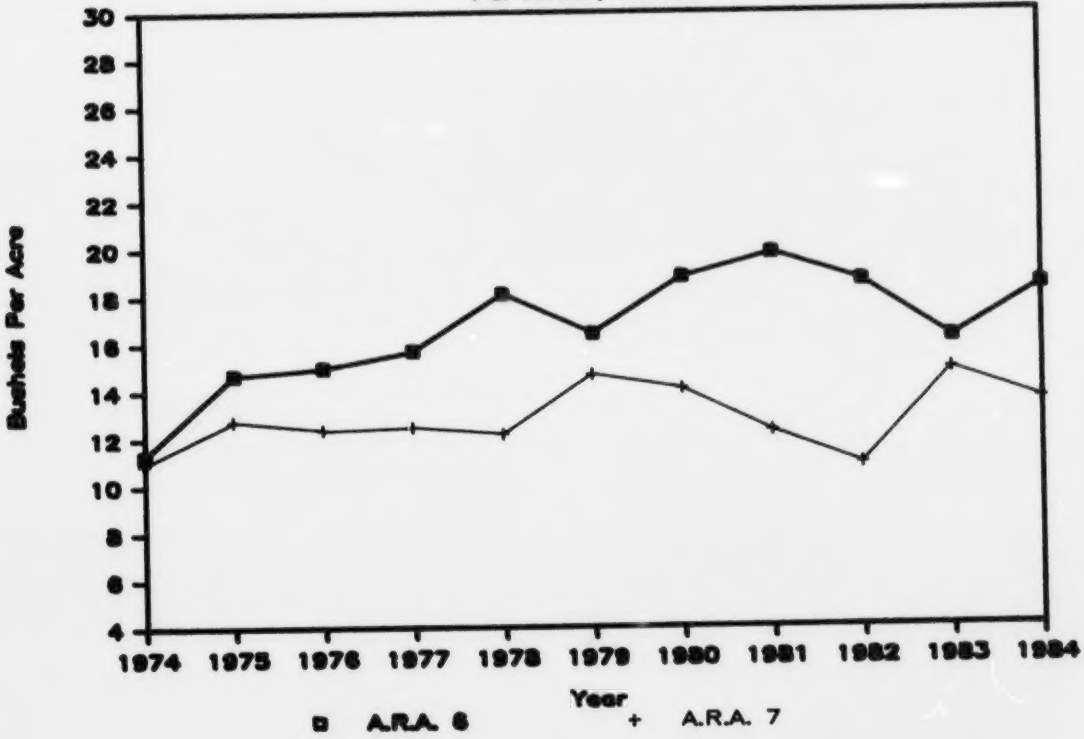
Per A.R.A., 74–84



II. Yield Estimates for Major Crops in Alberta Based on CWB Data

Section II Outline

Section II is divided into three subsections, each with two further sub-subsections. The data used for this entire section is based on Canadian Wheat Board (CWB) elevator agent surveys.

Subsection IIA outlines yield estimates for the major crops by Census Division (CD) for the 11-year period between 1974 and 1984. Four-year average yields for 1981 to 1984 data have also been calculated. In addition, the coefficients of variation (CVs) and sample sizes are provided for the 4-year data.

Subsection IIB follows the same format as IIA except the data has been arranged to provide results on a Regional basis.

Subsection IIC uses the CWB data again but it is presented to depict Agricultural Reporting Areas (ARAs) in Alberta. (See map on p. vi.) ARAs generally encompass the areas of two or more Census Divisions. There are seven ARAs in Alberta and their boundaries generally differ from the six Regions defined by Alberta Agriculture.

Subsection IIA Highlights

The yield estimates in this subsection differ somewhat from the Statistics Canada data discussed in Section 1 although general trends over time and between areas are very similar. The most noticeable differences between the two data sources were found for crops not comprising a large part of the area's total cropped acreage. (Appendix I provides a breakdown of acreage distributions for the six major crops by ARA).

A closer examination of the data is provided in the second part of this subsection (pages 37 - 42). Three graphs for each crop are provided.

Continued on p. 16b

A. i) Yield Estimates by Census Division,
1974 - 1984

ii) 4-Year Average of Yield, CV and
Number of Reports, by Census Division,
1981 - 1984

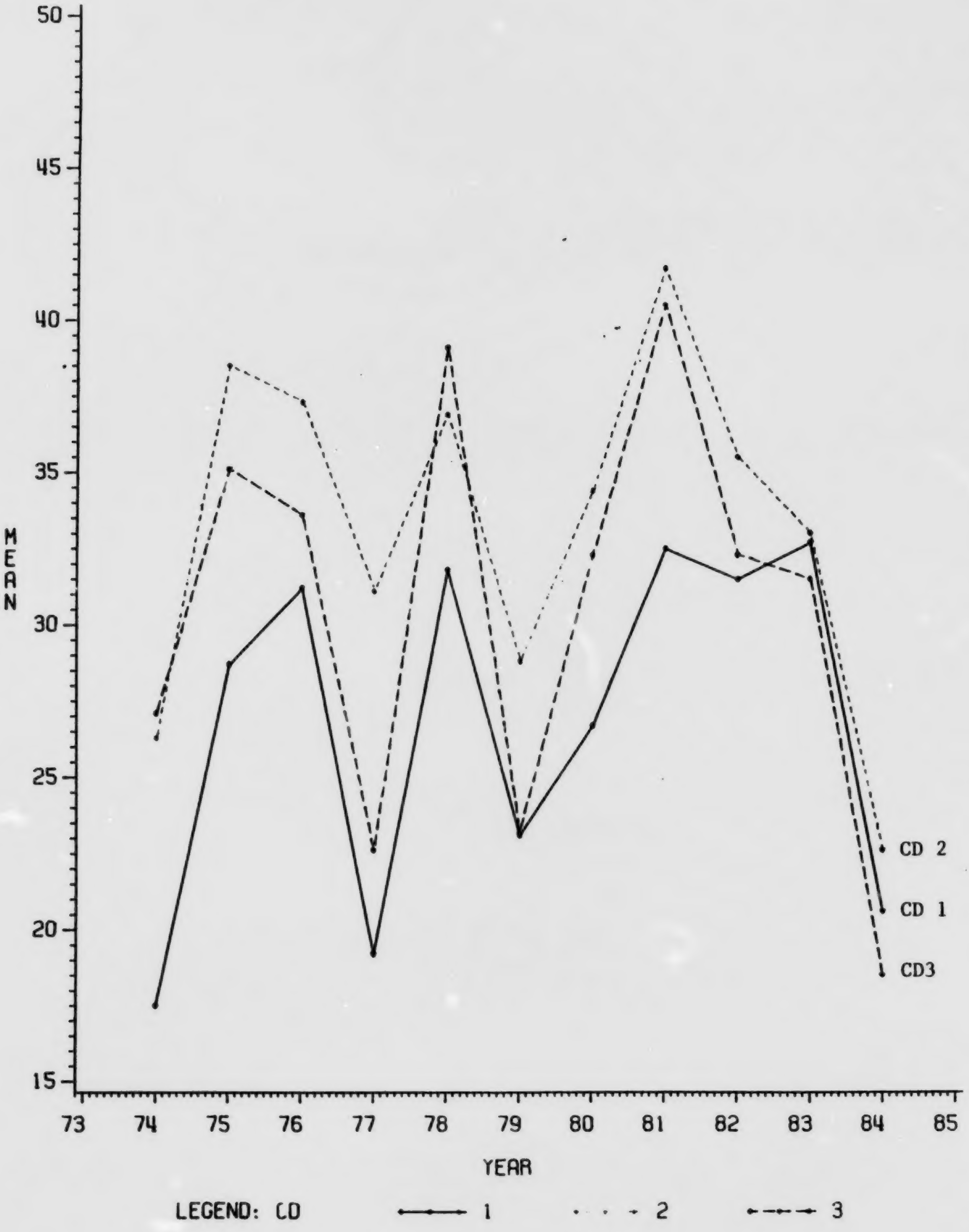
The first graph indicates 4-year average yields, the second depicts the coefficient of variation (CV) and the third indicates the average number of reports (questionnaires completed) for each CD.

According to the data presented, CWRS (Canada Western Red Spring Wheat) yields are between 25 and 40 bushels per acre depending on the area. CDs 5, 6, 8, 11 and 13 are generally the highest yielding areas. Oats yields are shown to be highest in CDs 2, 8, 11, 13 and 14. The five highest yielding barley areas are CDs 2, 5, 6, 8 and 13. Rye yields are highest in CDs 5, 6 and 8 while canola appears to reach its best potential in CDs 2, 5 and 8. Flaxseed yields are highest in CDs 2, 8 and 14.

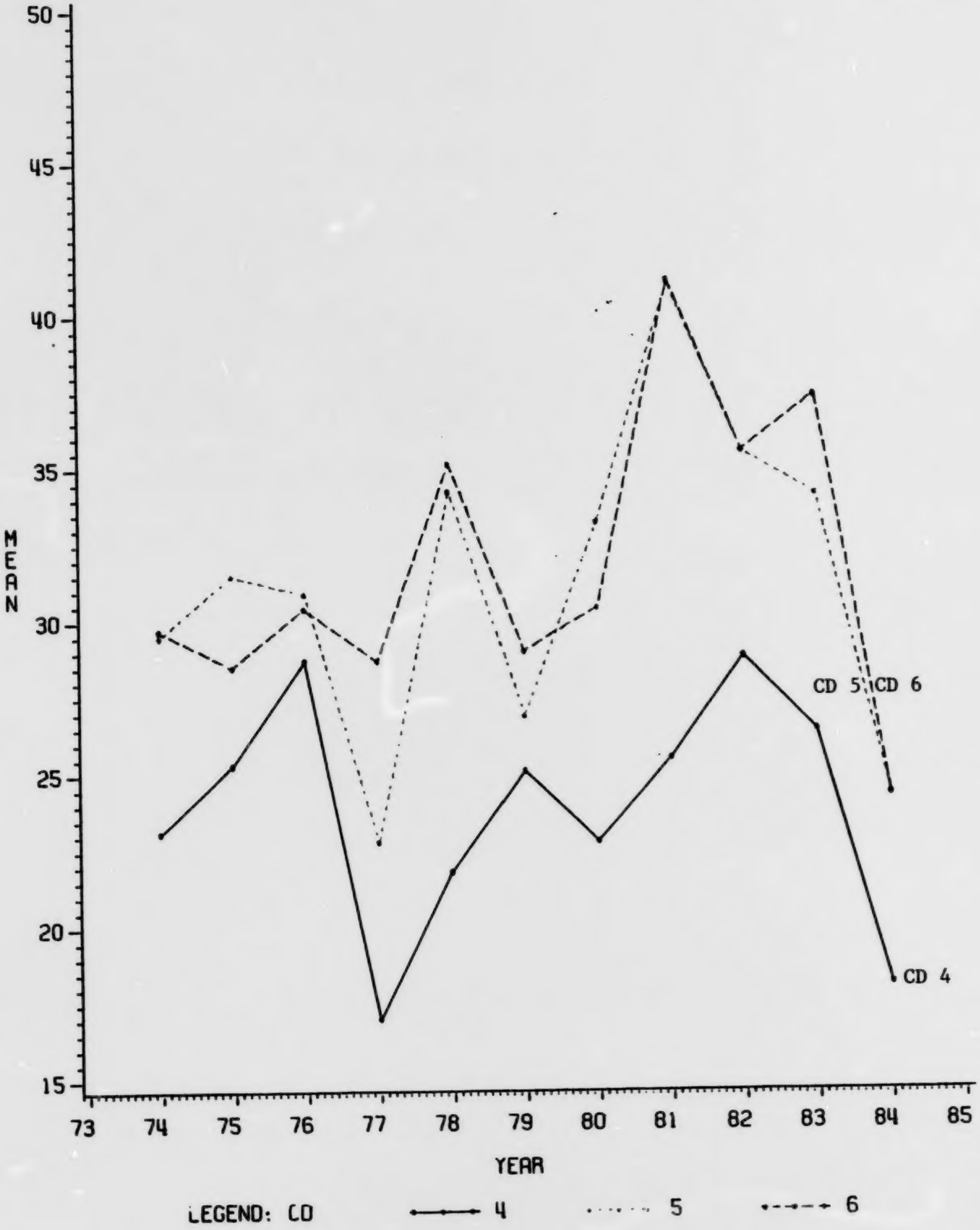
These conclusions may differ from data obtained from other sources for several reasons. The main purpose for providing information on sample size and CVs was to allow some examination of the data. As a rule of thumb, a CV of up to 20% is considered statistically strong. Several cases are observed where the CVs reach 30%. In such cases, true "average" yields may differ considerably.

A second gauge for data quality hinges on sample size. In areas where the CV is 0%, we will observe a sample size of 1 or 2. Small sample sizes tend to produce questionable results, especially when the geographic area is large and variable. Ideally, the most reliable yield estimates provided in this report are those exhibiting the largest sample sizes coupled with the lowest coefficients of variation. Unfortunately, CVs and sample sizes are not available for the Statistics Canada data used in other sections of this report.

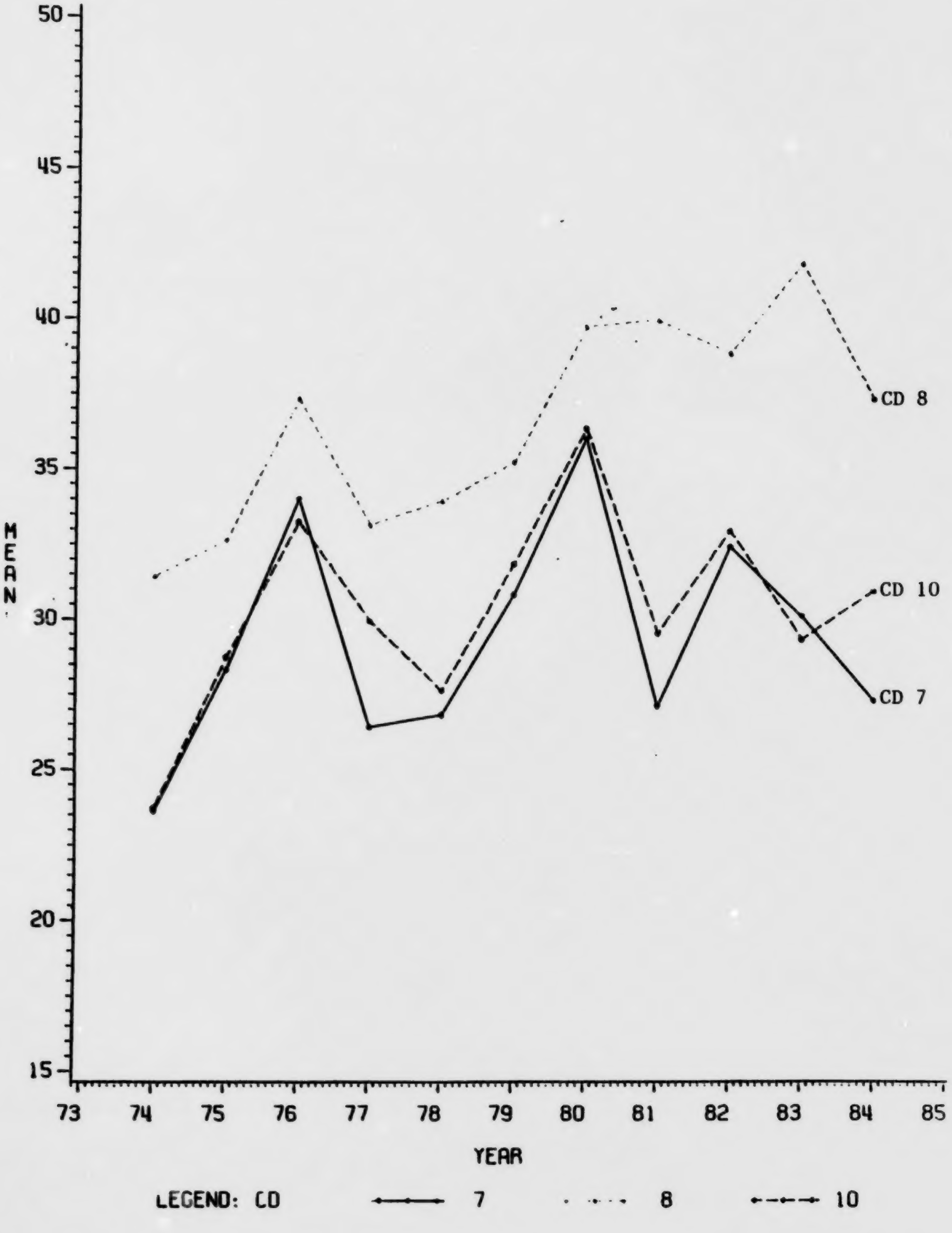
C.W.B. YIELDS FOR WHEAT, PER C.D., 74–84



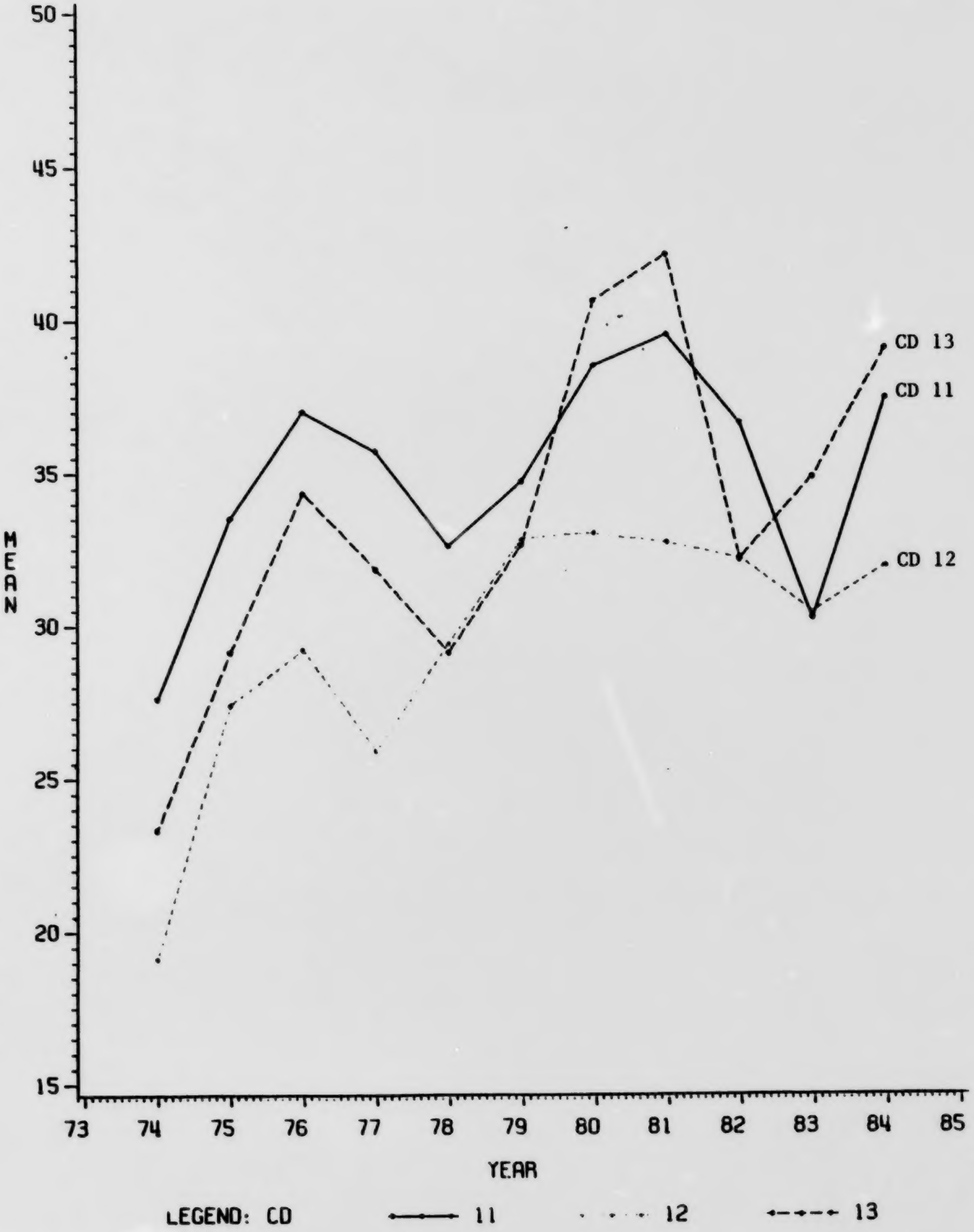
C.W.B. YIELDS FOR WHEAT, PER C.D., 74–84



C.W.B. YIELDS FOR WHEAT, PER C.D., 74–84



C.W.B. YIELDS FOR WHEAT, PER C.D., 74–84



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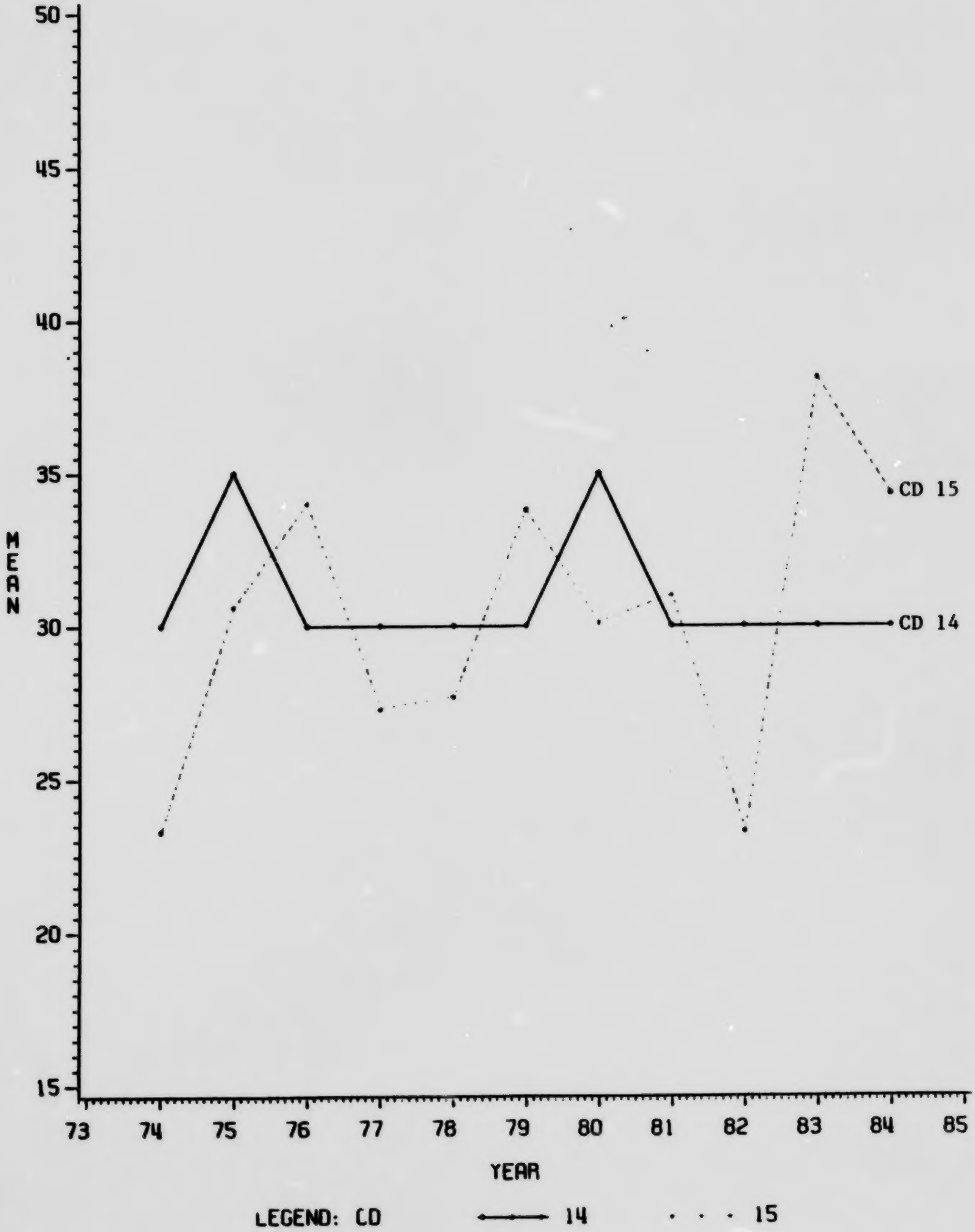
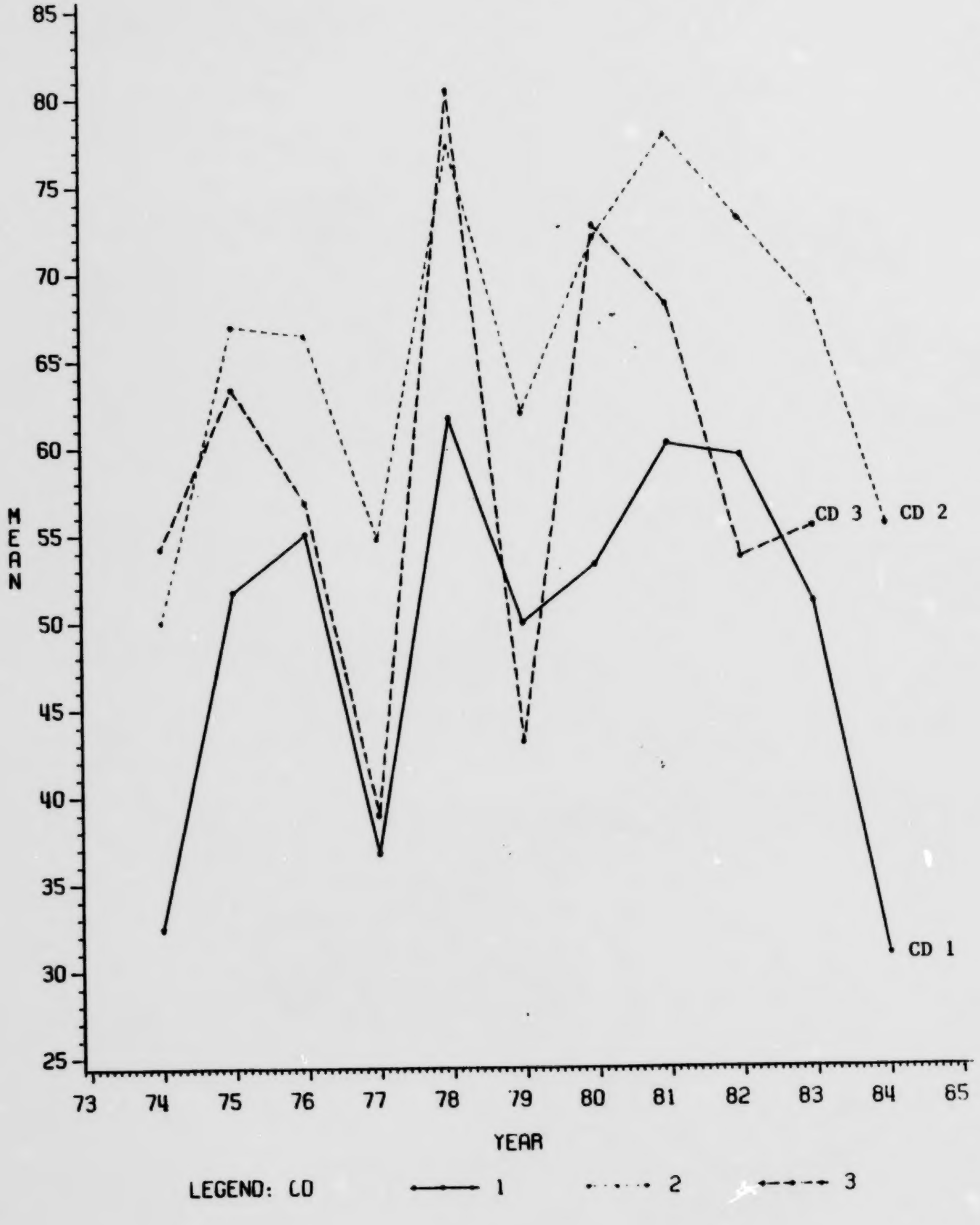


C.W.B. YIELDS FOR OATS, PER C.D., 74–84



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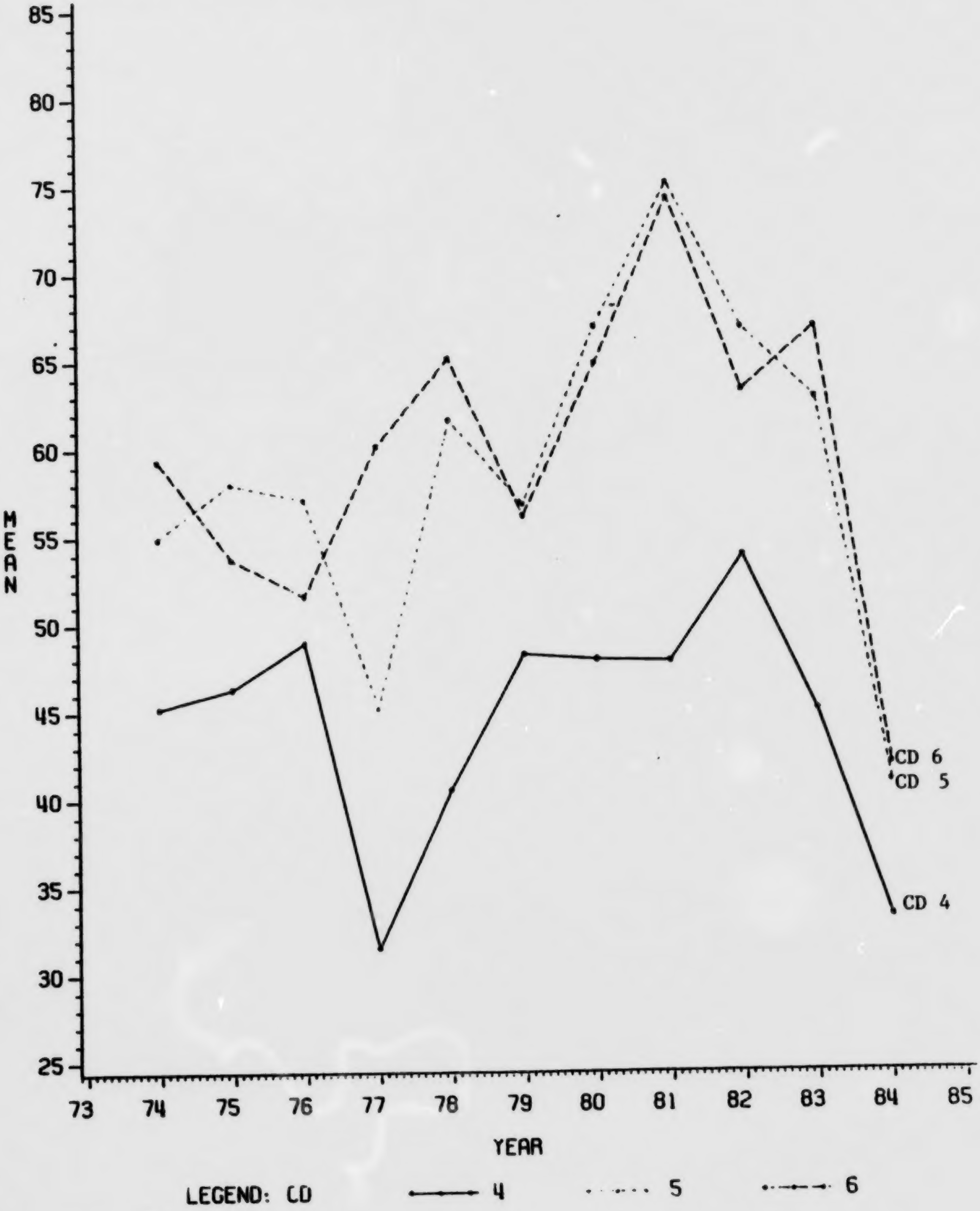

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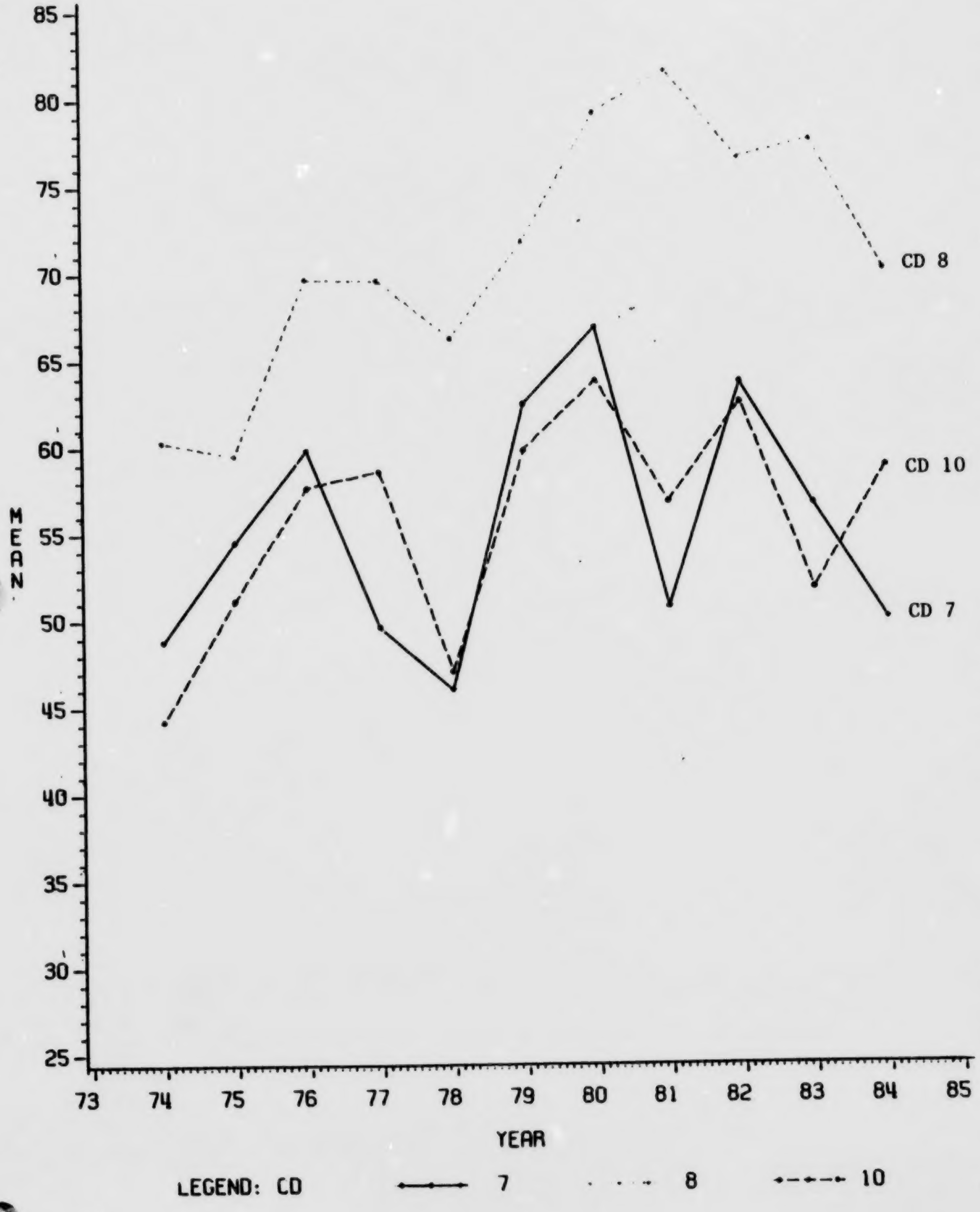

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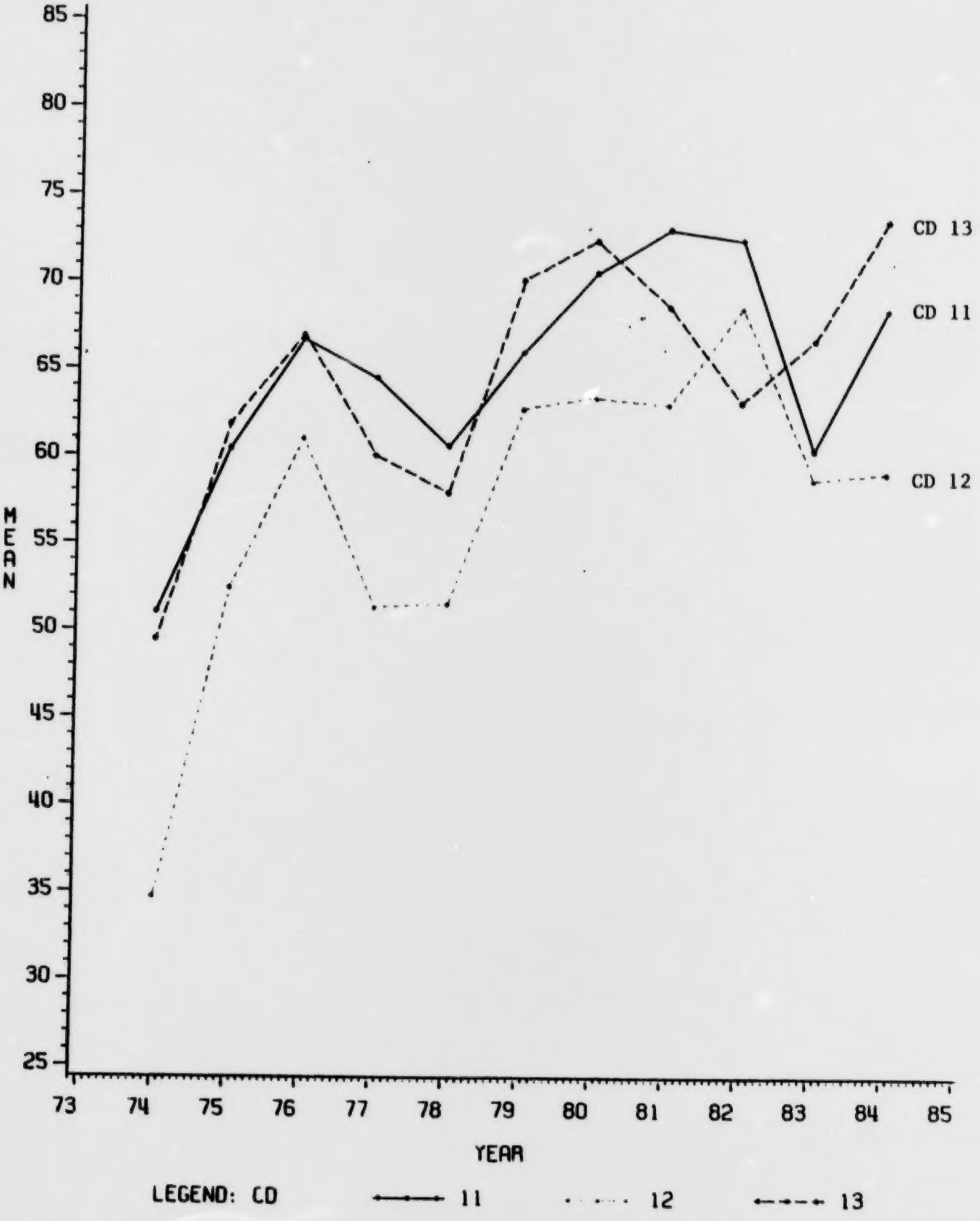

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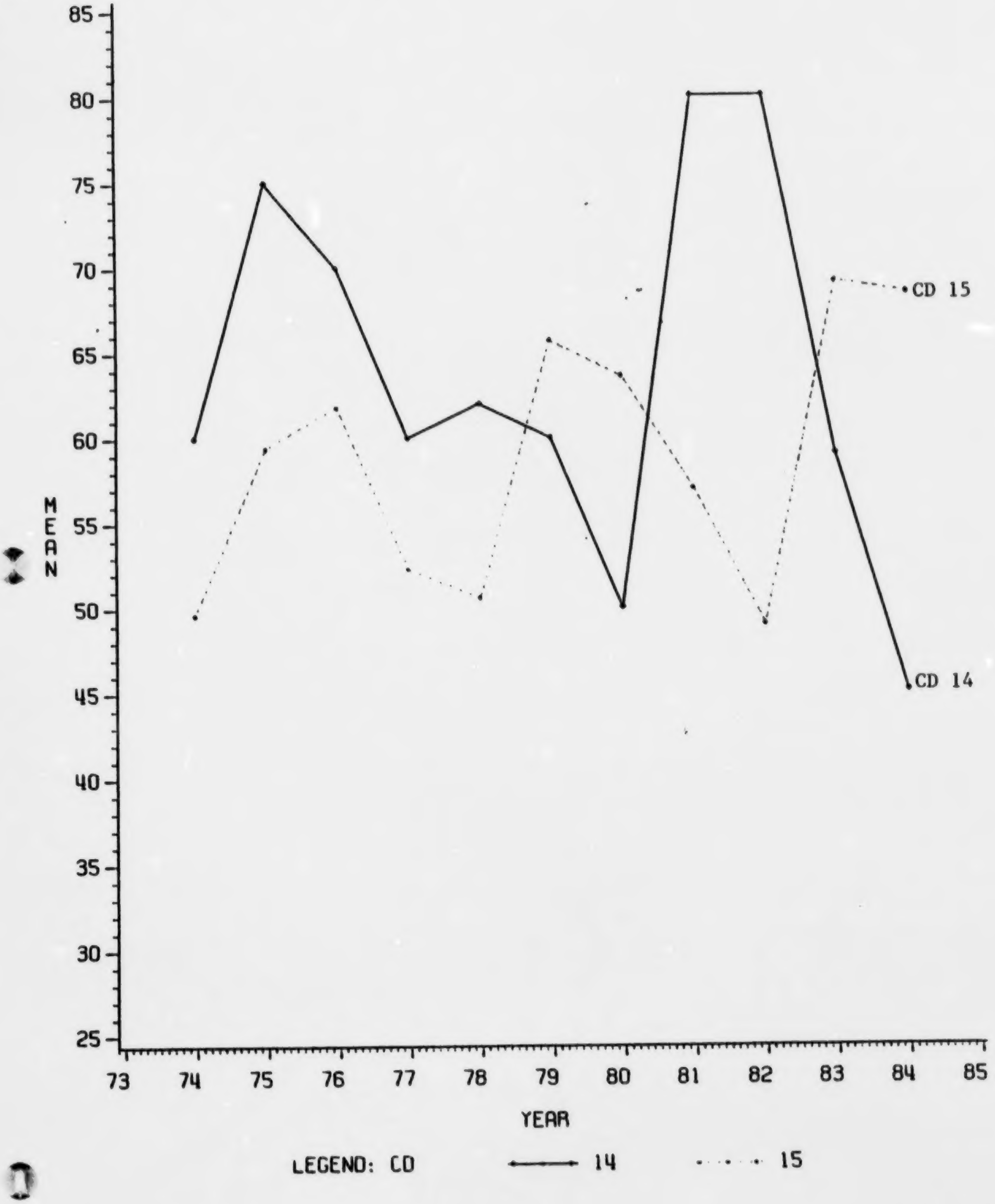
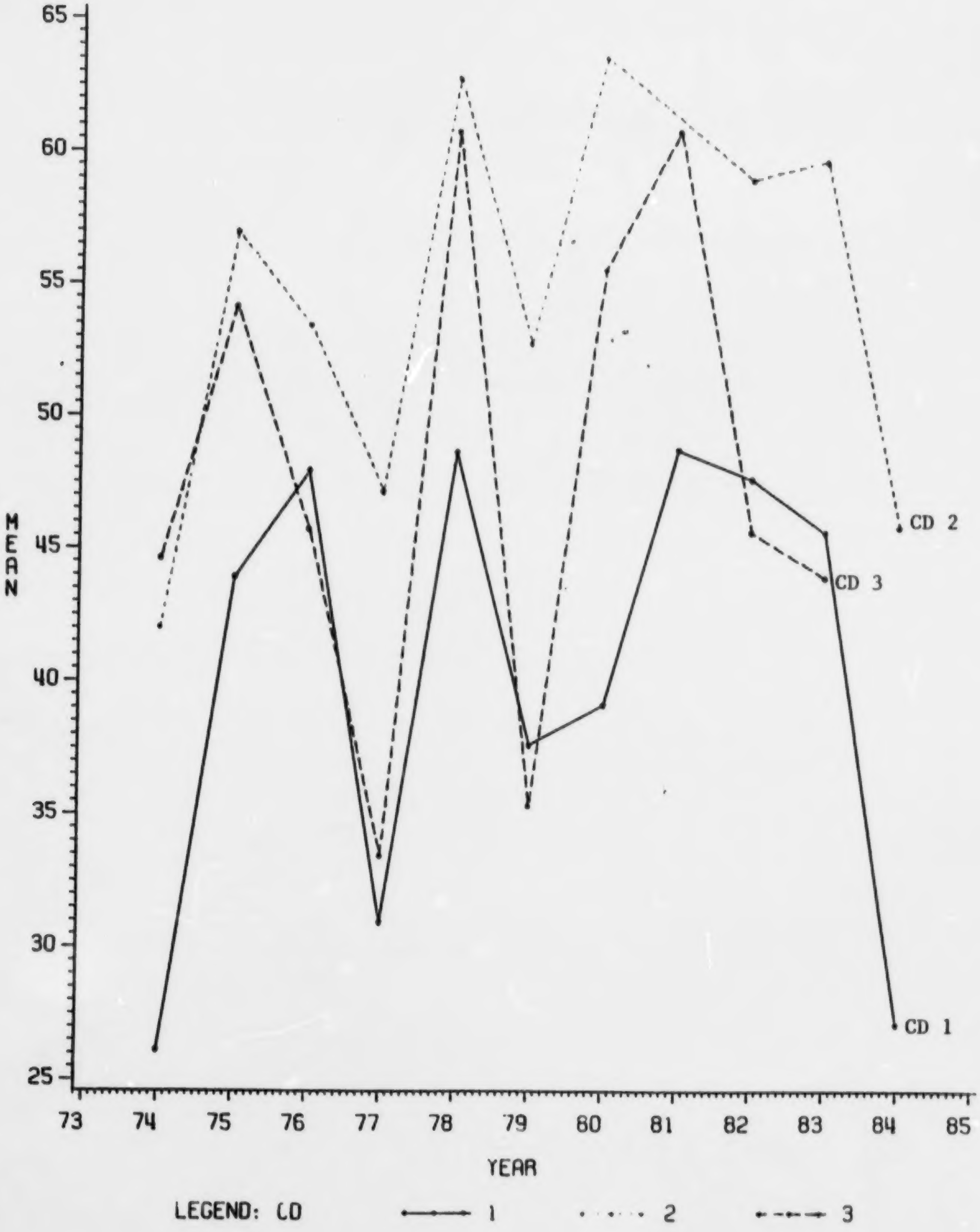
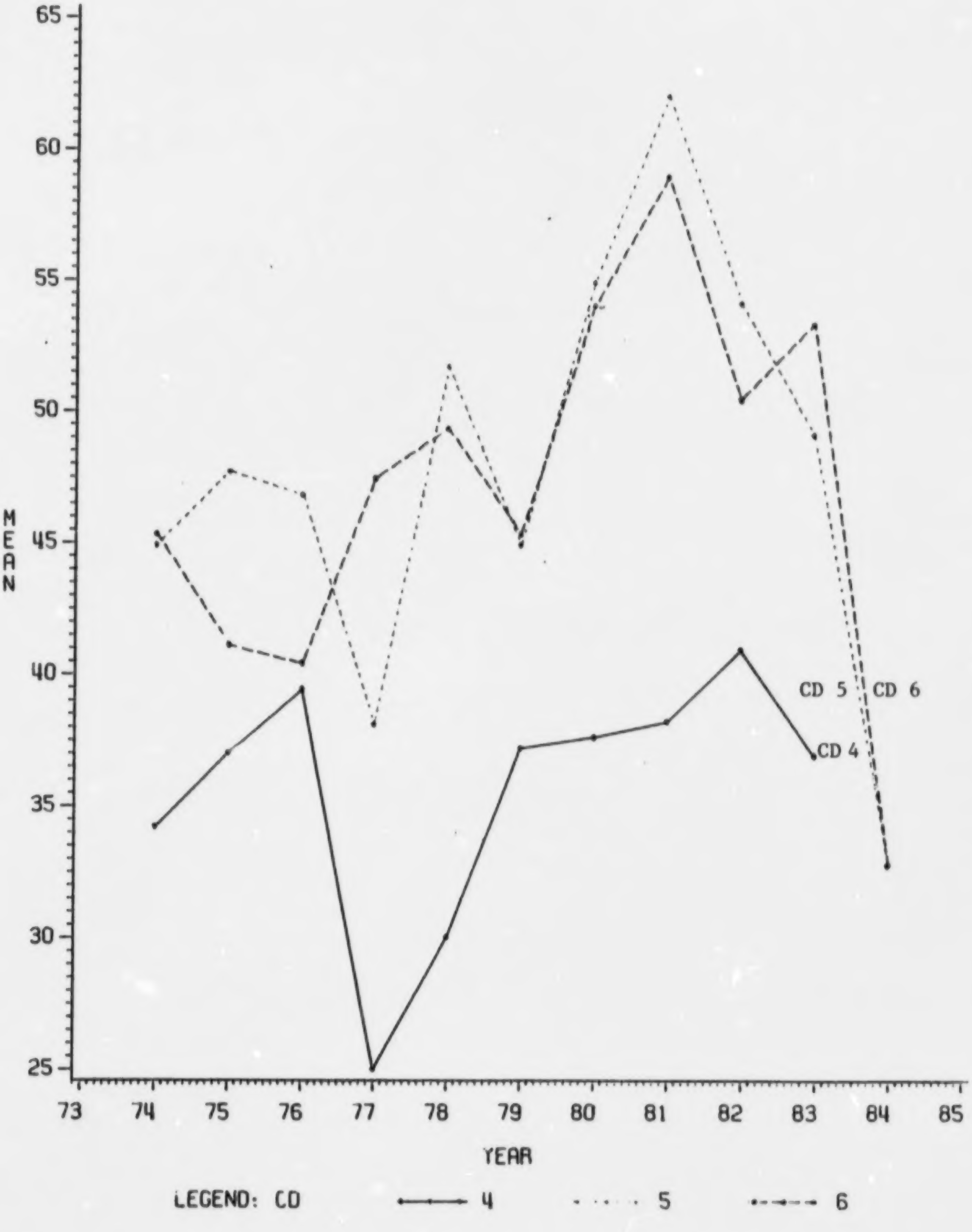


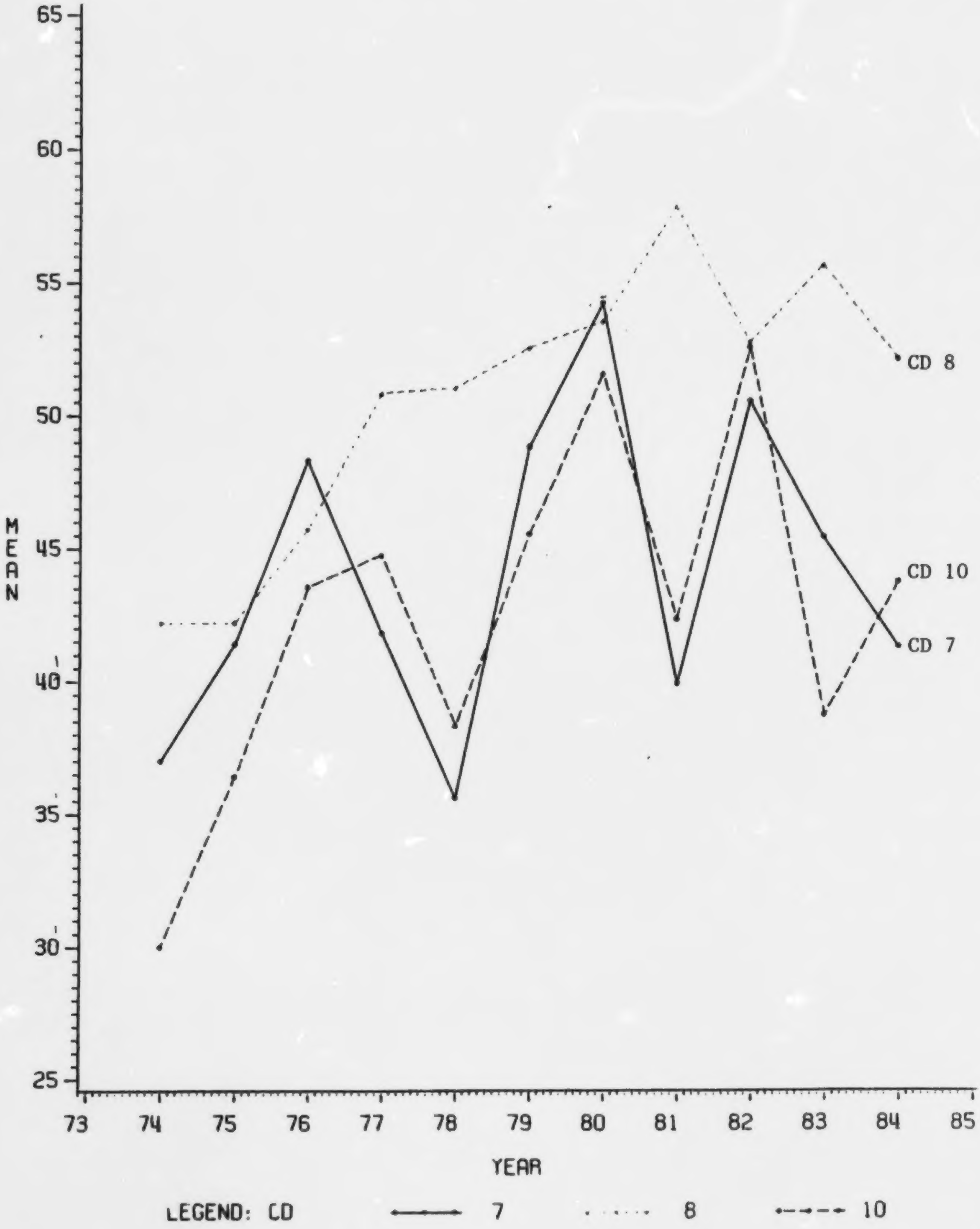
C.W.B. YIELDS FOR BARLEY PER C.D., 74-84



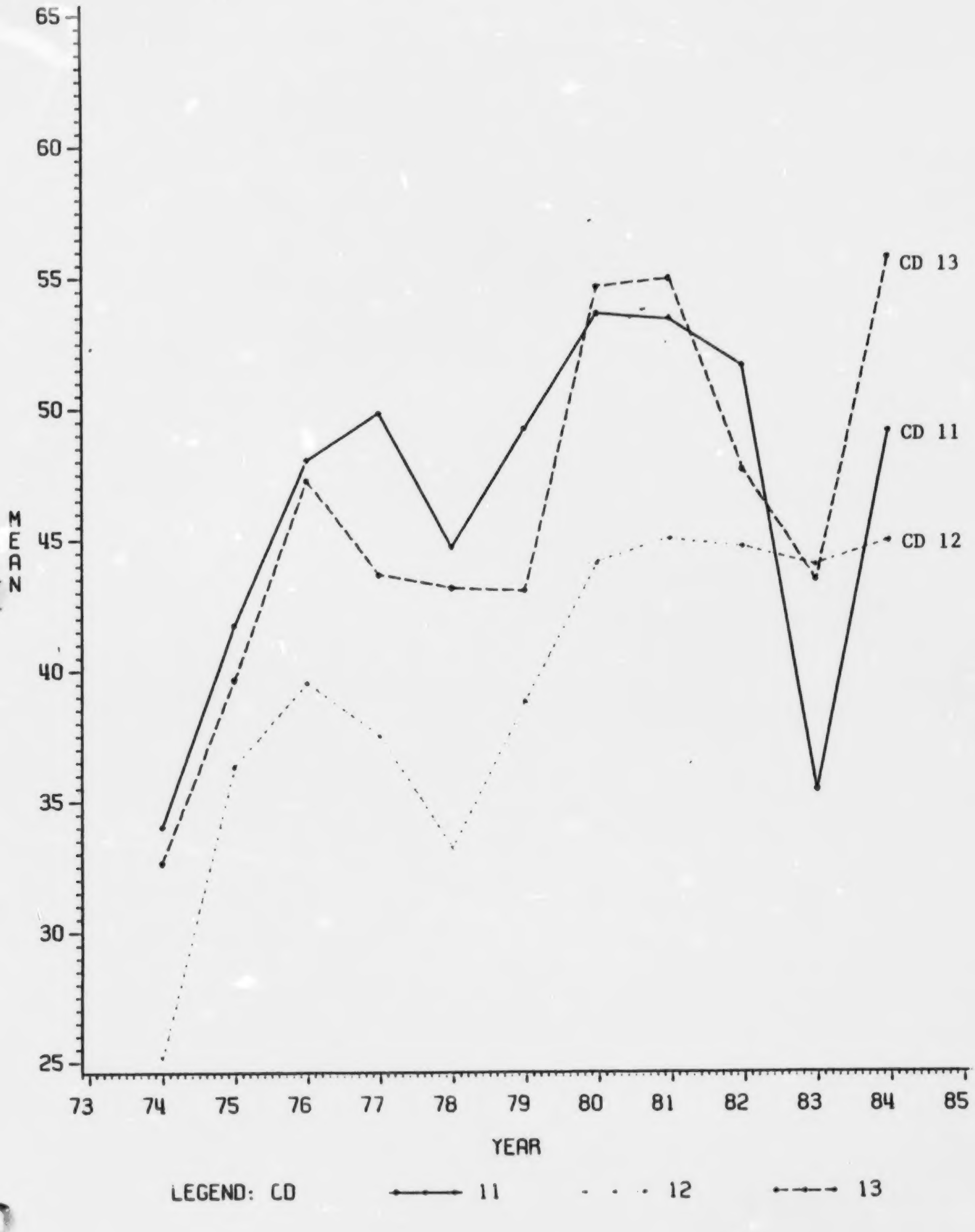
C.W.B. YIELDS FOR BARLEY PER C.D., 74-84



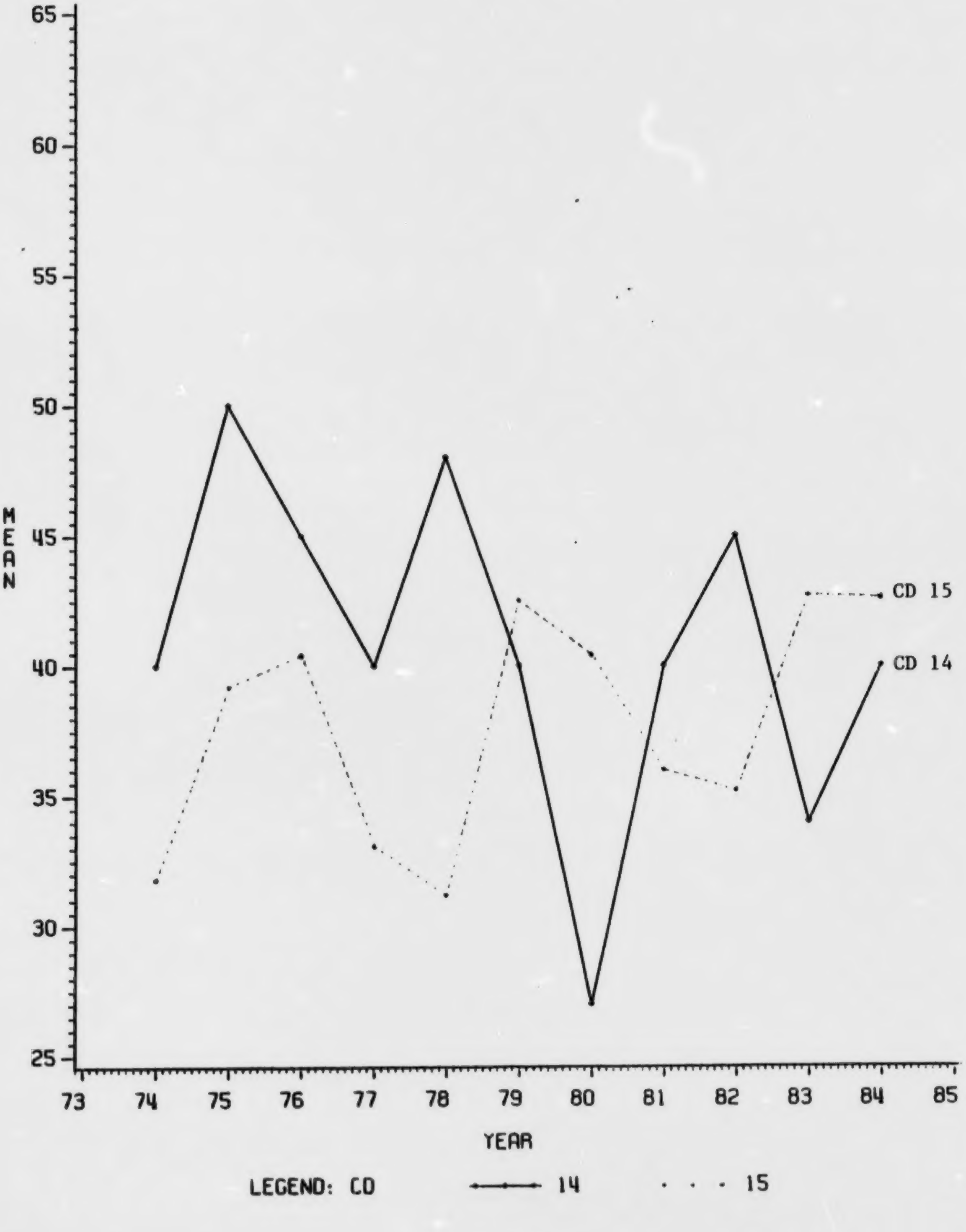
C.W.B. YIELDS FOR BARLEY PER C.D., 74-84



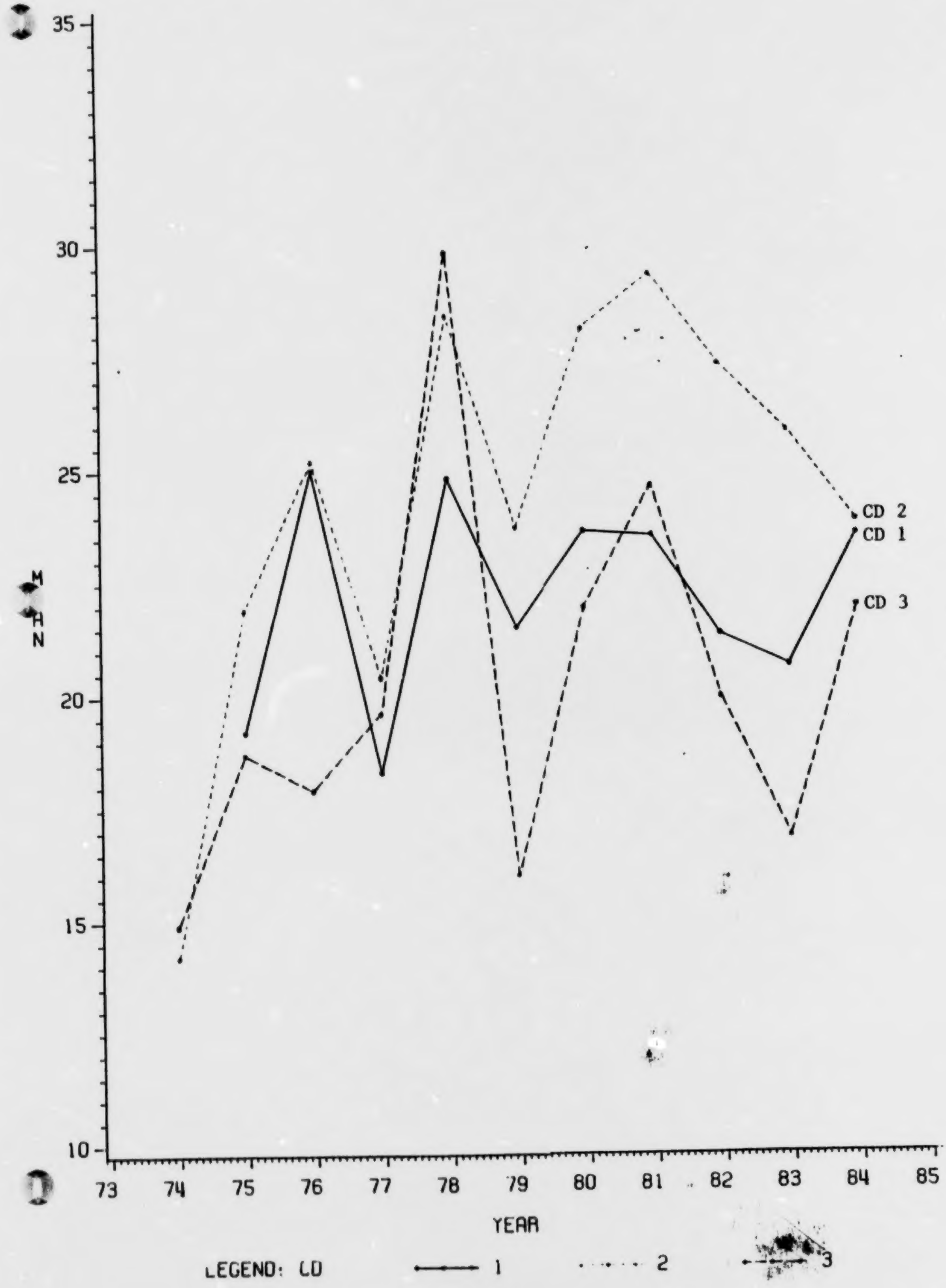
C.W.B. YIELDS FOR BARLEY PER C.D., 74-84



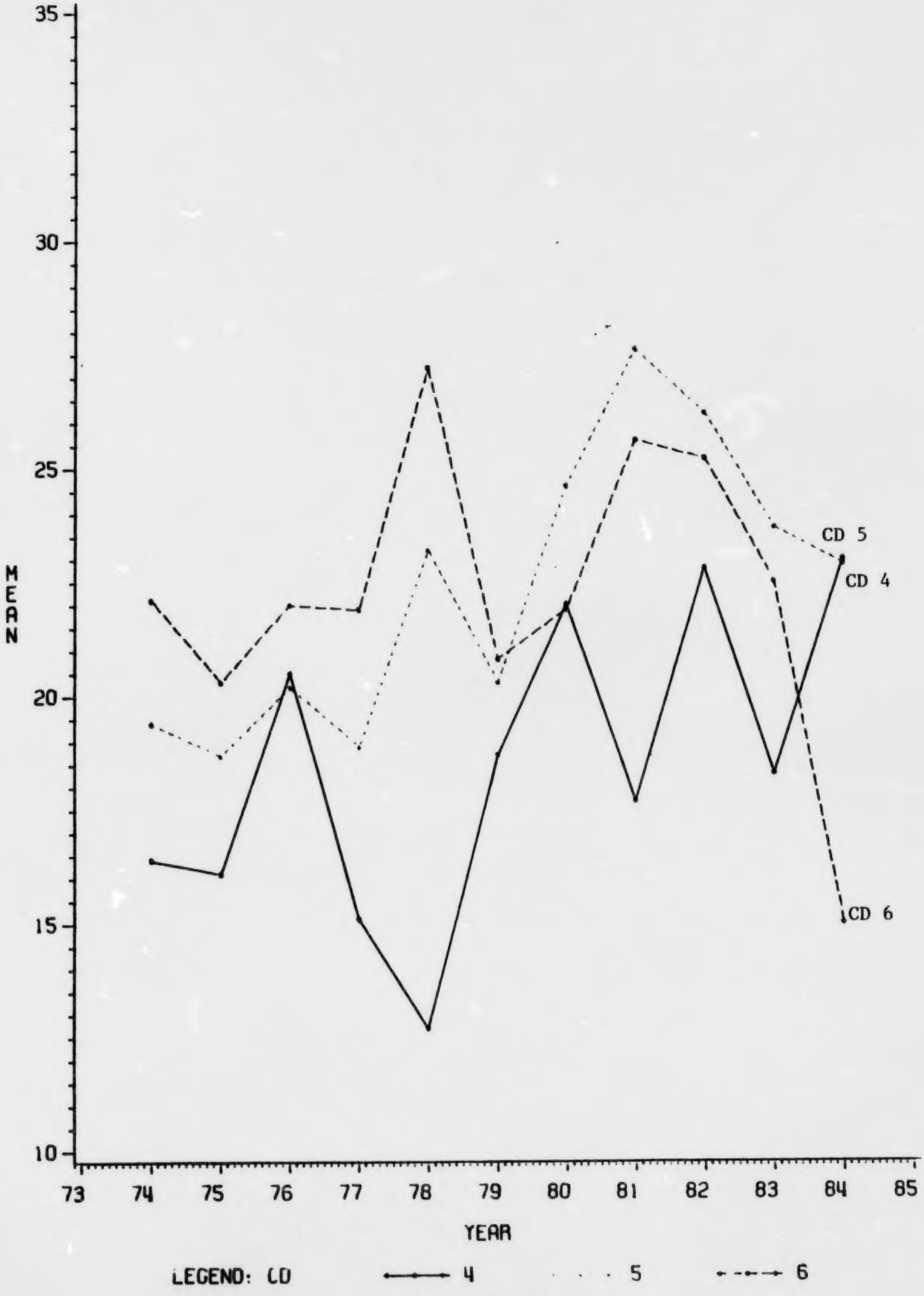
C.W.B. YIELDS FOR BARLEY PER C.D., 74–84



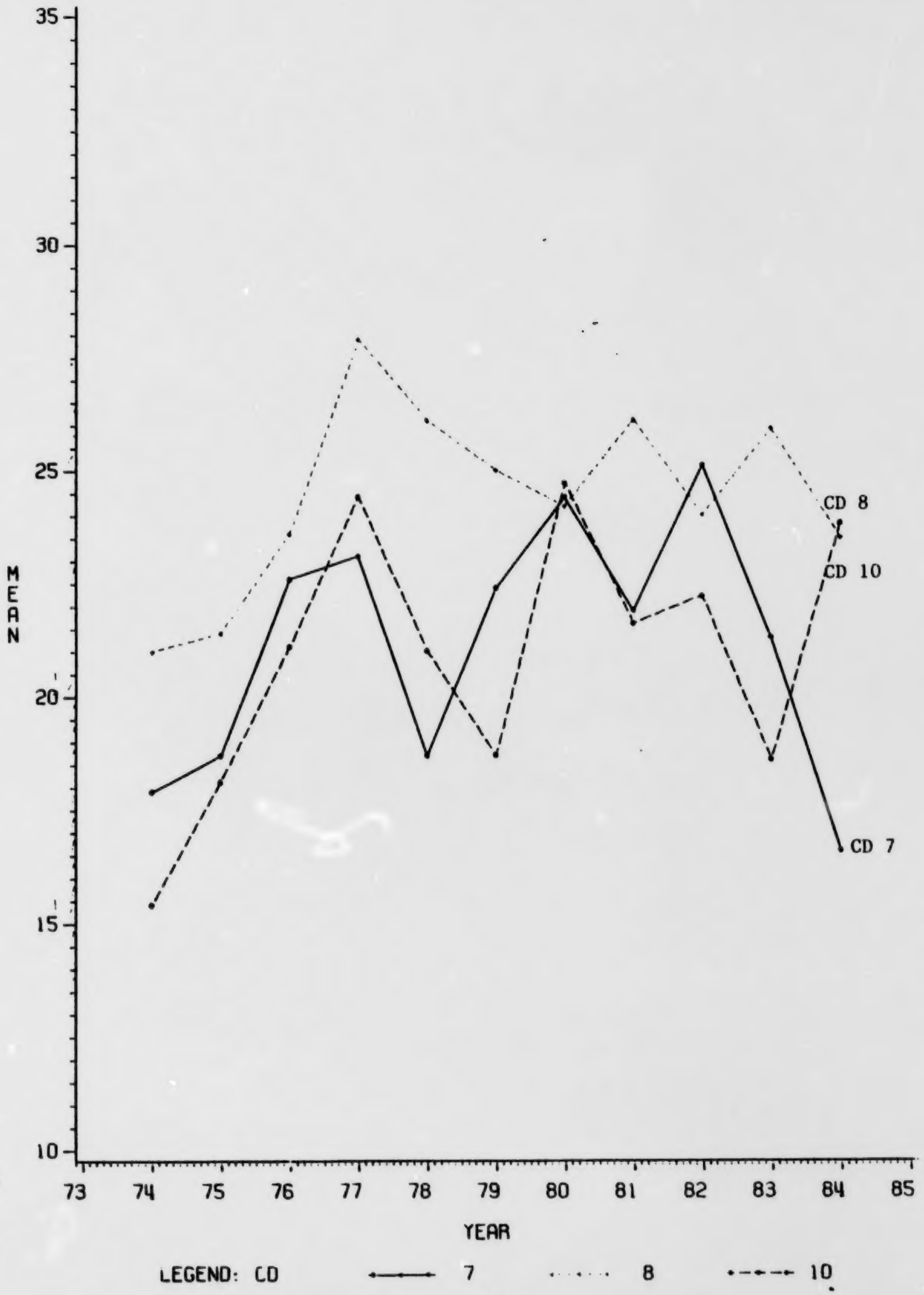
C.W.B. YIELDS FOR CANOLA, PER C.D., 74–84



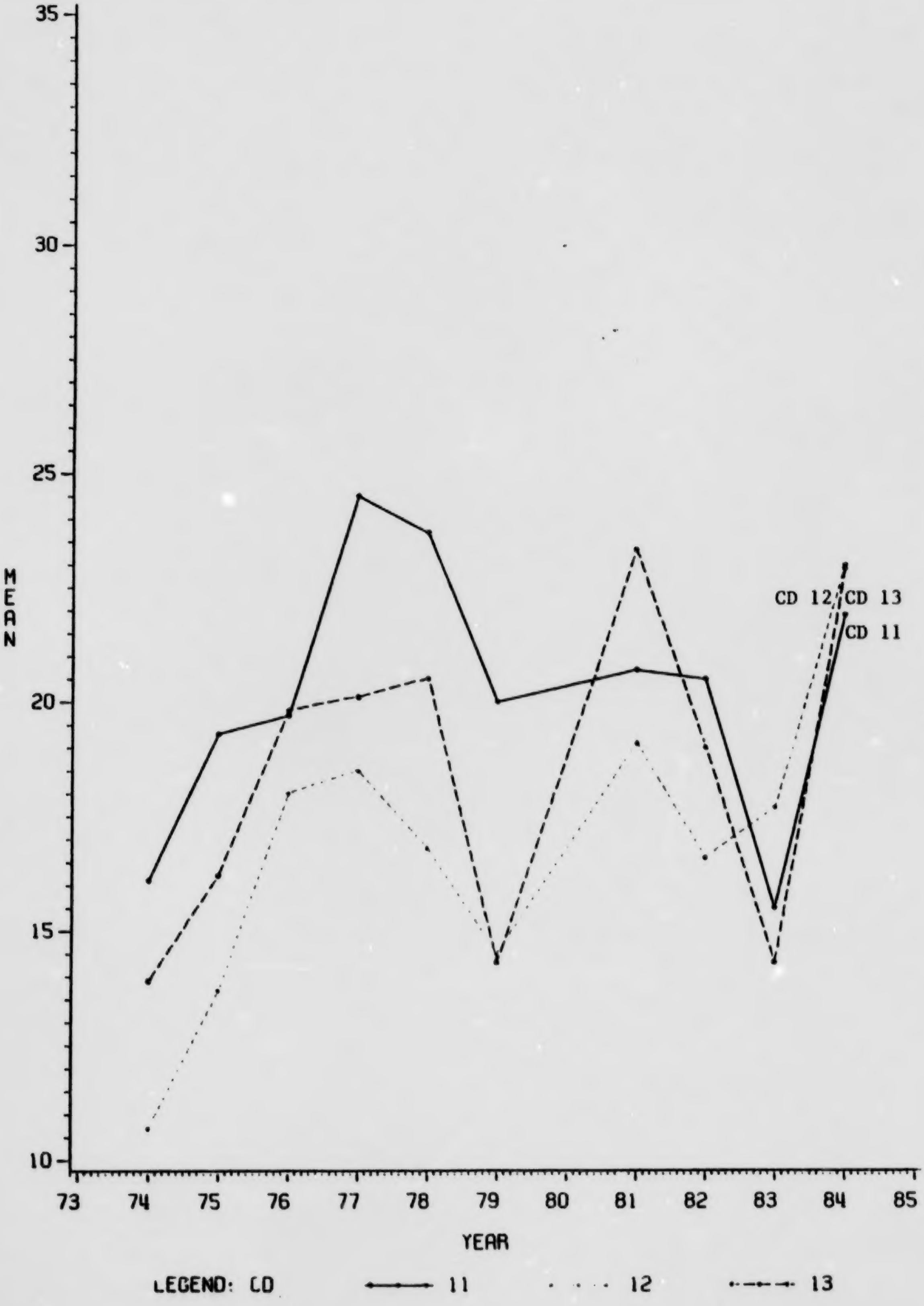
C.W.B. YIELDS FOR CANOLA, PER C.D., 74–84



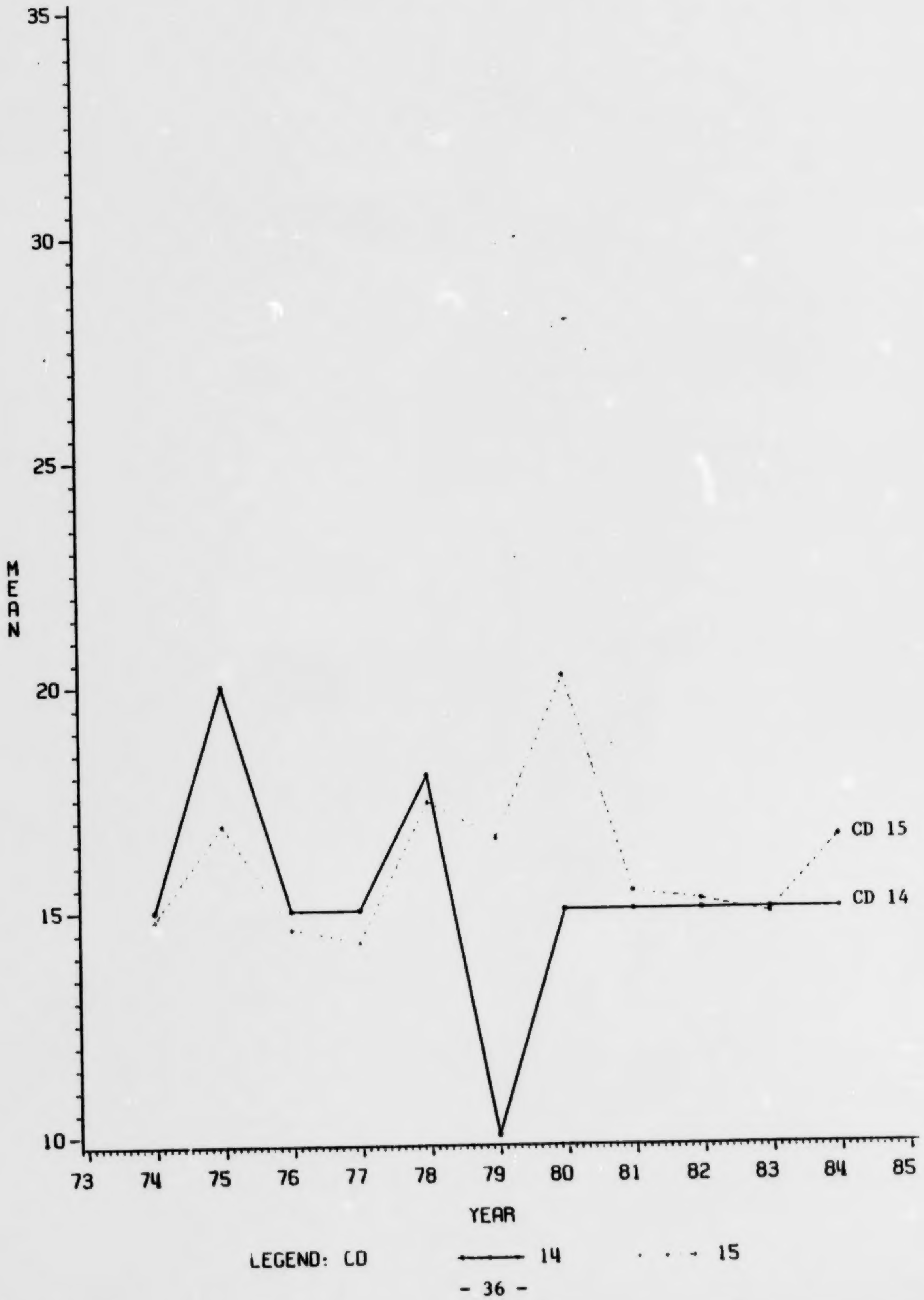
C.W.B. YIELDS FOR CANOLA, PER C.D., 74–84



C.W.B. YIELDS FOR CANOLA, PER C.D., 74-84

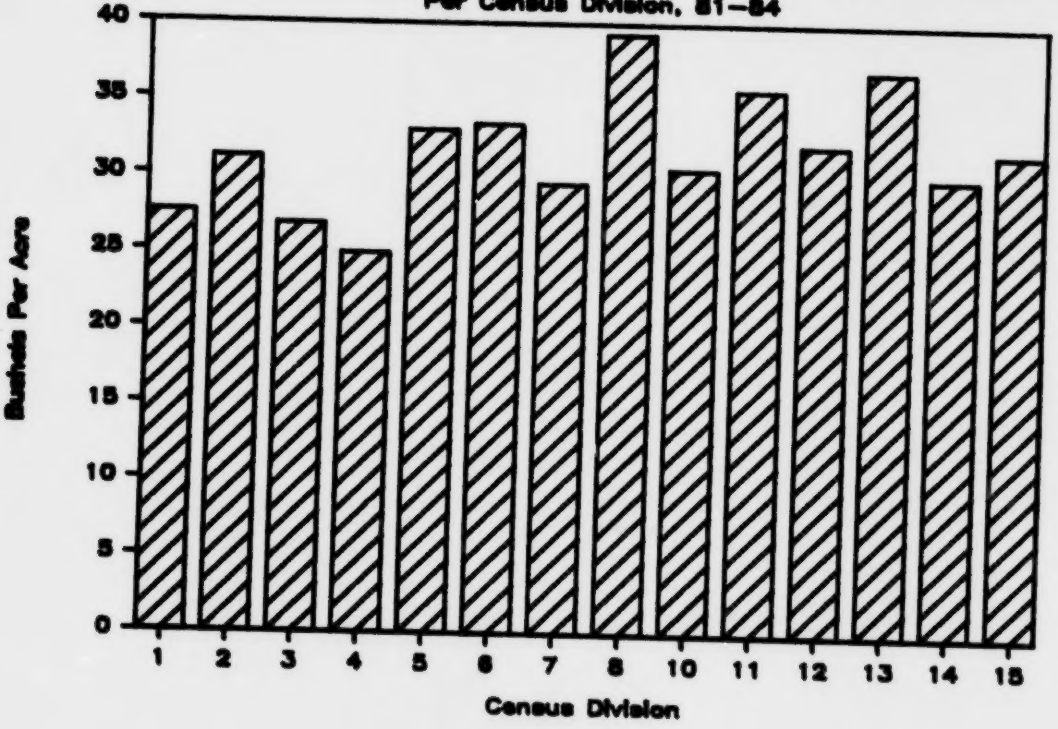


C.W.B. YIELDS FOR CANOLA, PER C.D., 74−84



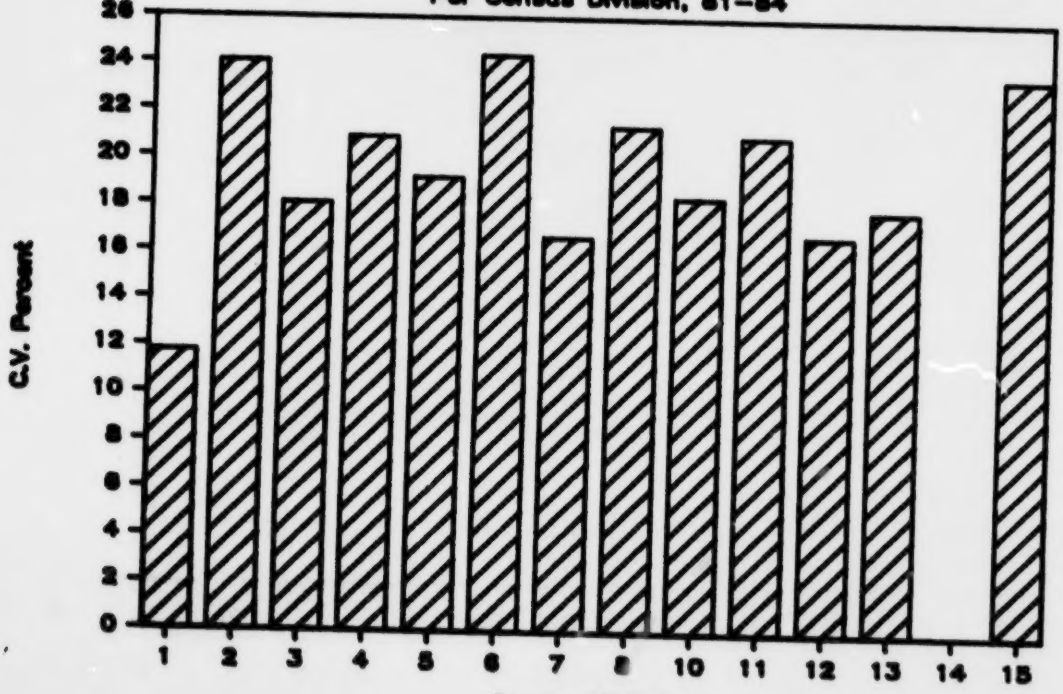
C.W.B. AVE. YIELDS FOR C.W.R.S.

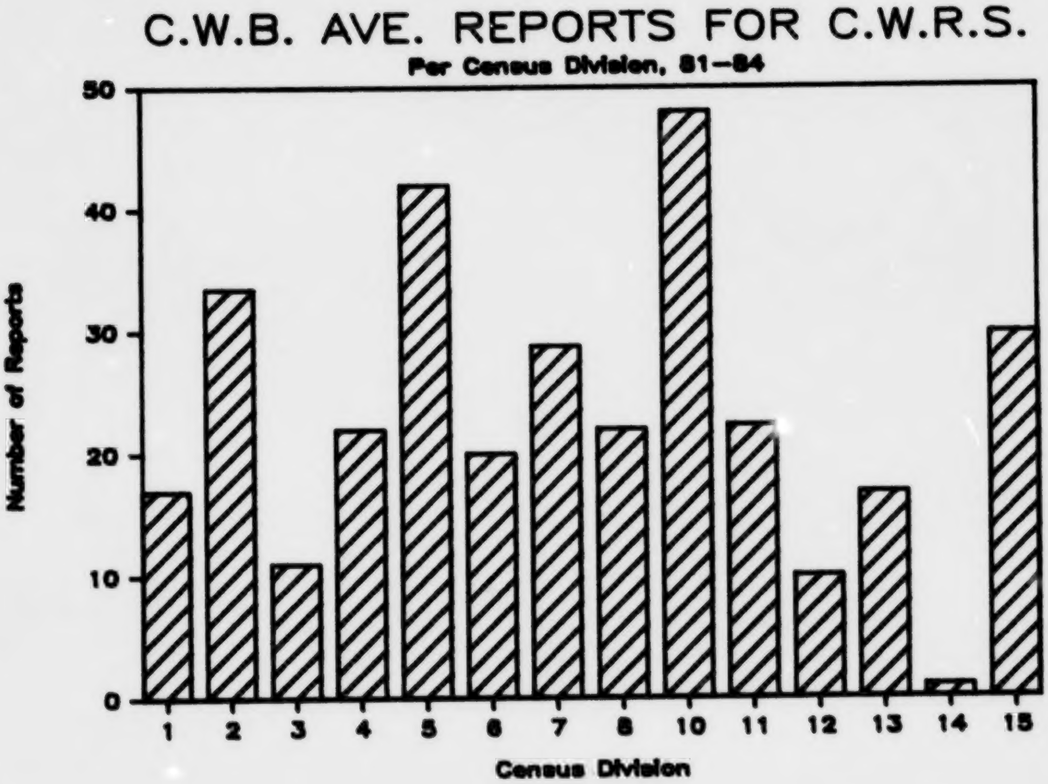
Per Census Division, 81–84

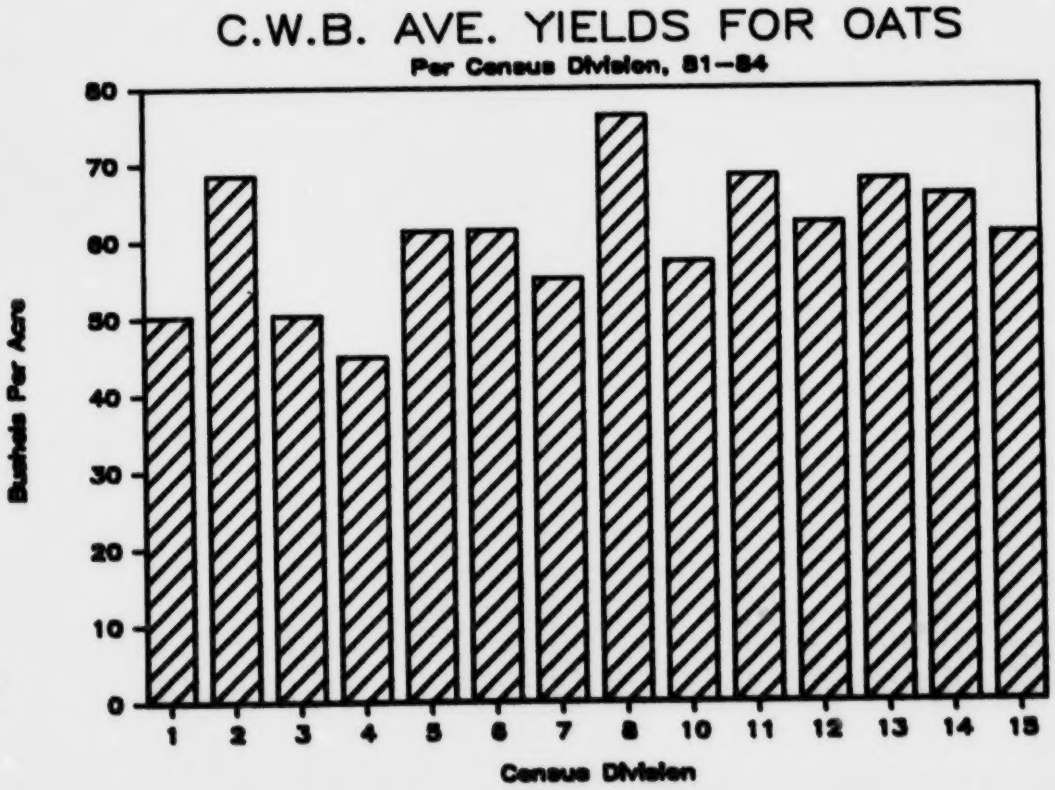


C.W.B. AVE. C.V. FOR C.W.R.S.

Per Census Division, 81–84

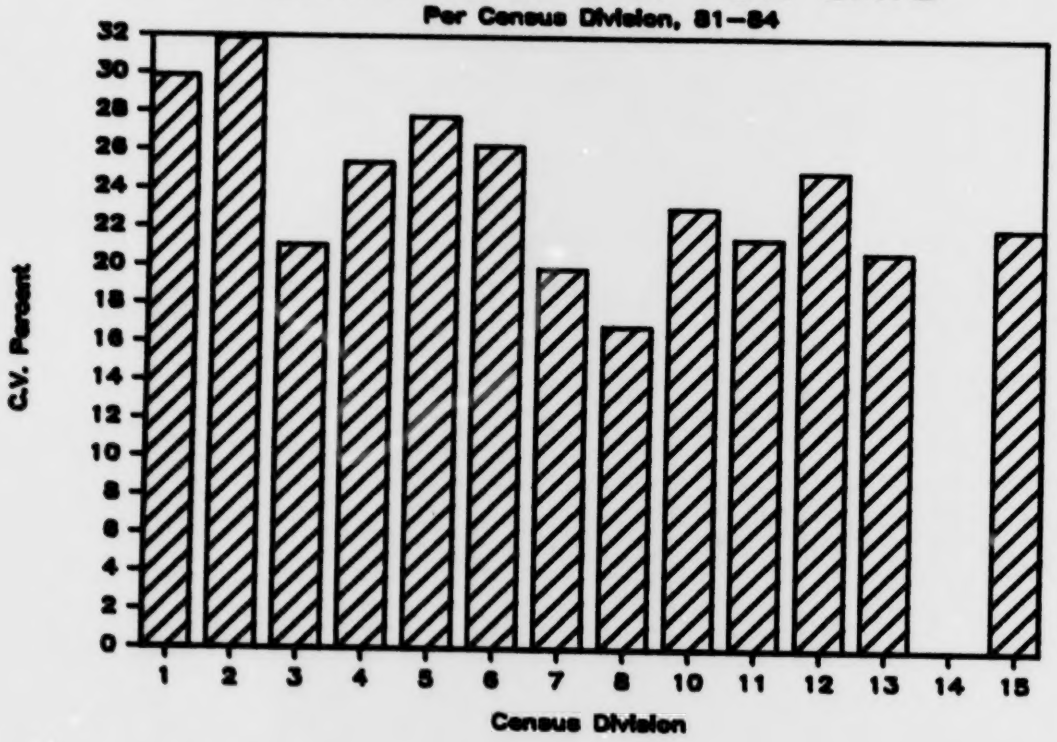



C.W.B. AVE. REPORTS FOR C.W.R.S.
Per Census Division, 81–84
Number of Reports
0
10
20
30
40
50
1
2
3
4
5
6
7
8
10
11
12
13
14
15
Census Division


C.W.B. AVE. YIELDS FOR OATS
Per Census Division, 81–84
Bushels Per Acre
0
10
20
30
40
50
60
70
80
1
2
3
4
5
6
7
8
10
11
12
13
14
15
Census Division

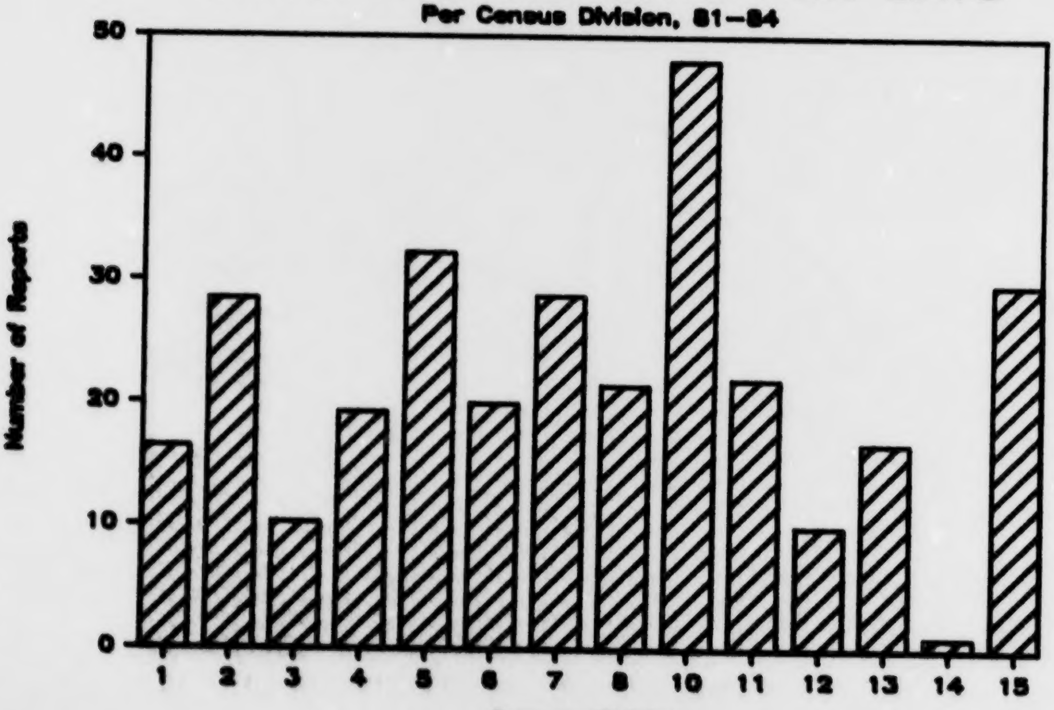
C.W.B. AVE. C.V. FOR OATS

Per Census Division, 81–84



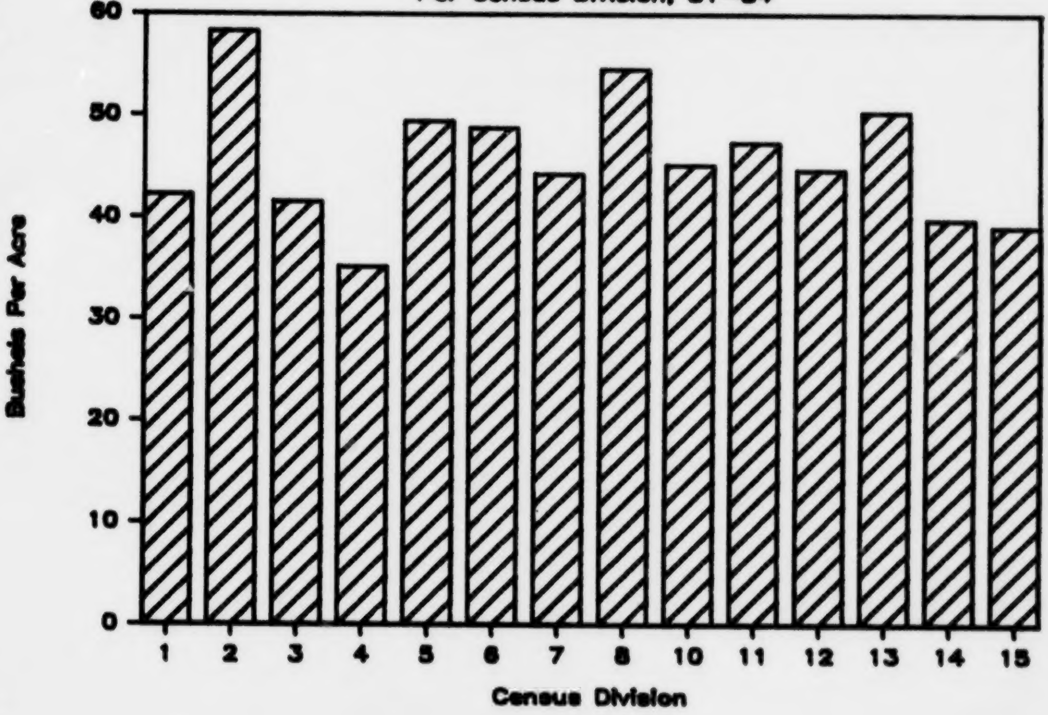
C.W.B. AVE. REPORTS FOR OATS

Per Census Division, 81–84



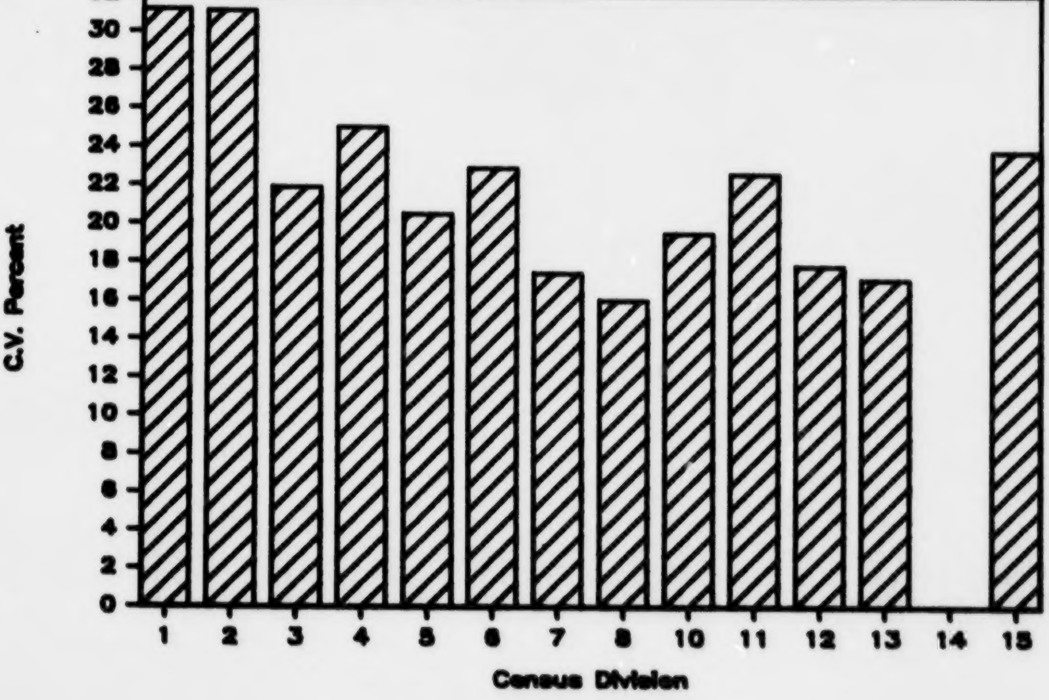
C.W.B. AVE. YIELDS FOR BARLEY

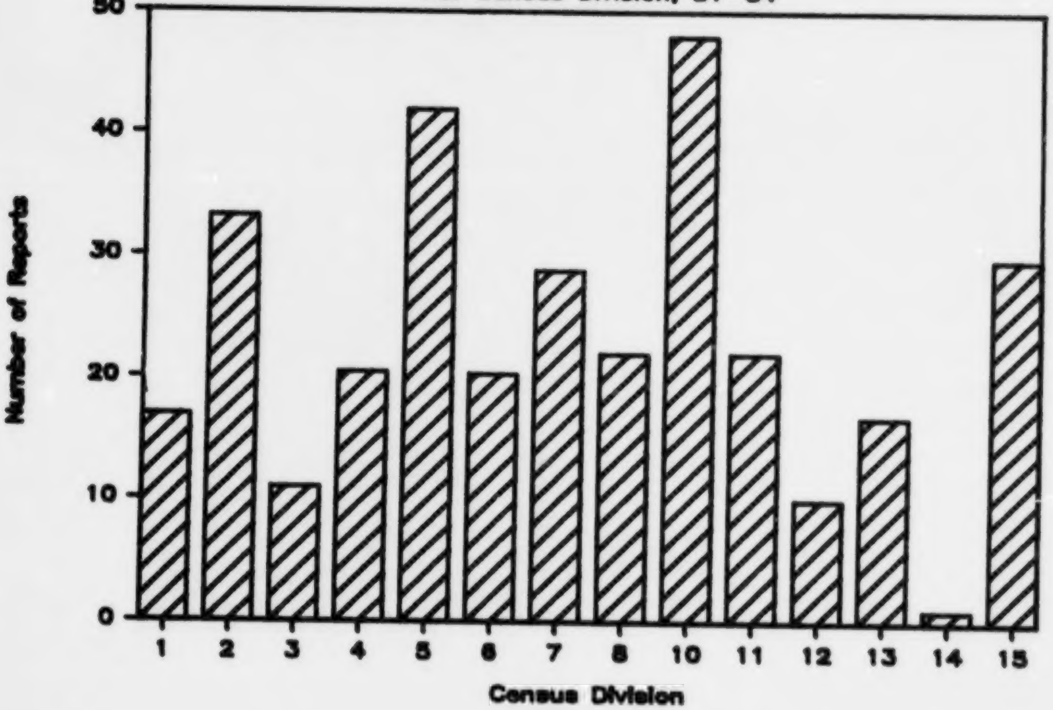
Per Census Division, 81–84



C.W.B. AVE. C.V. FOR BARLEY

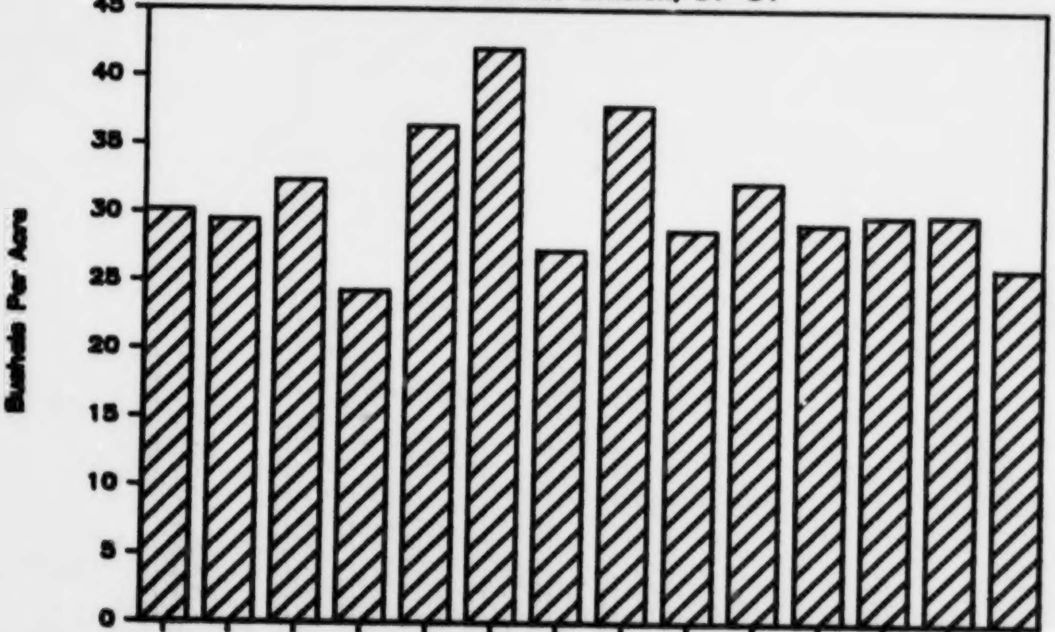
Per Census Division, 81–84





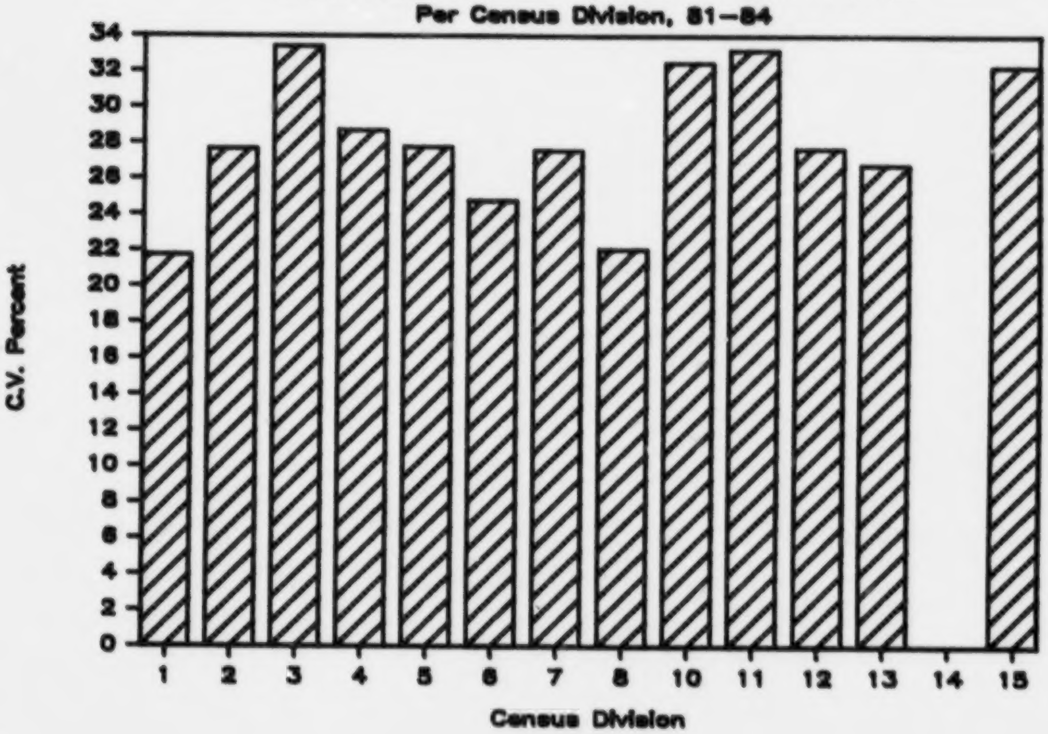
C.W.B. AVE. REPORTS FOR BARLEY

Per Census Division, 81–84



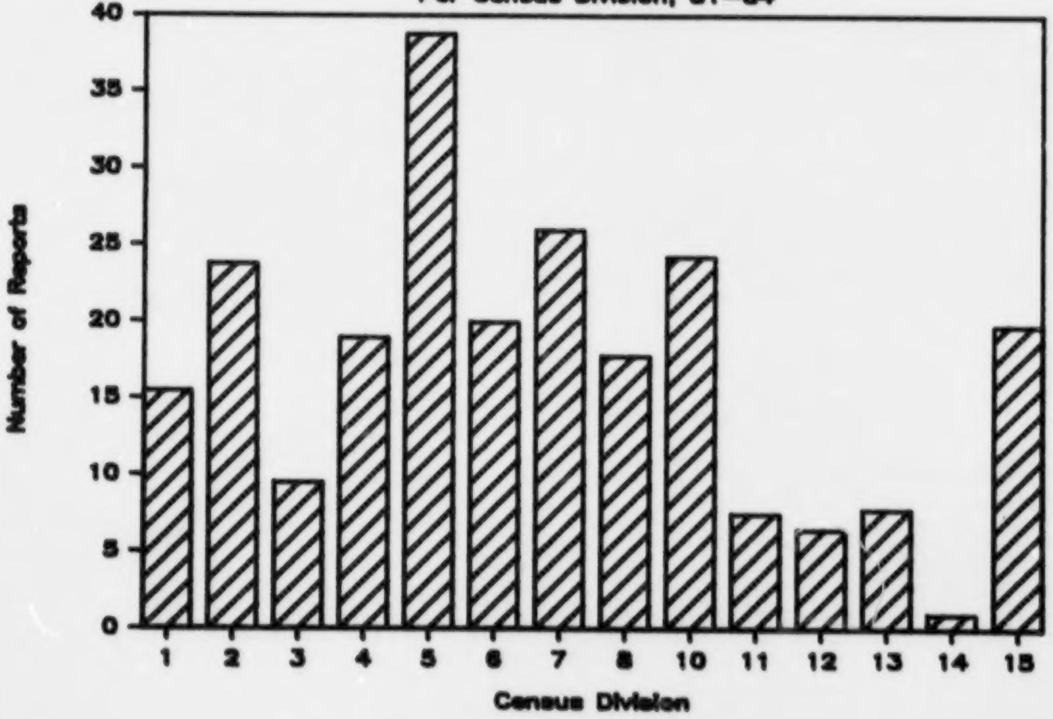
C.W.B. AVE. YIELDS FOR RYE

Per Census Division, 81–84



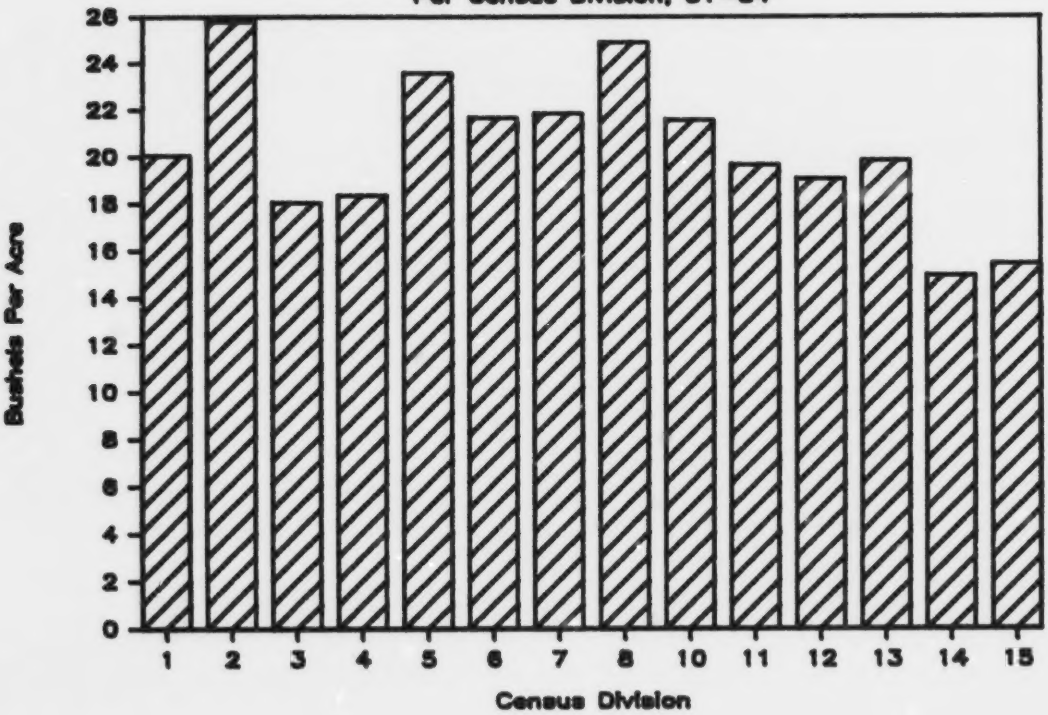
C.W.B. AVE. C.V. FOR RYE

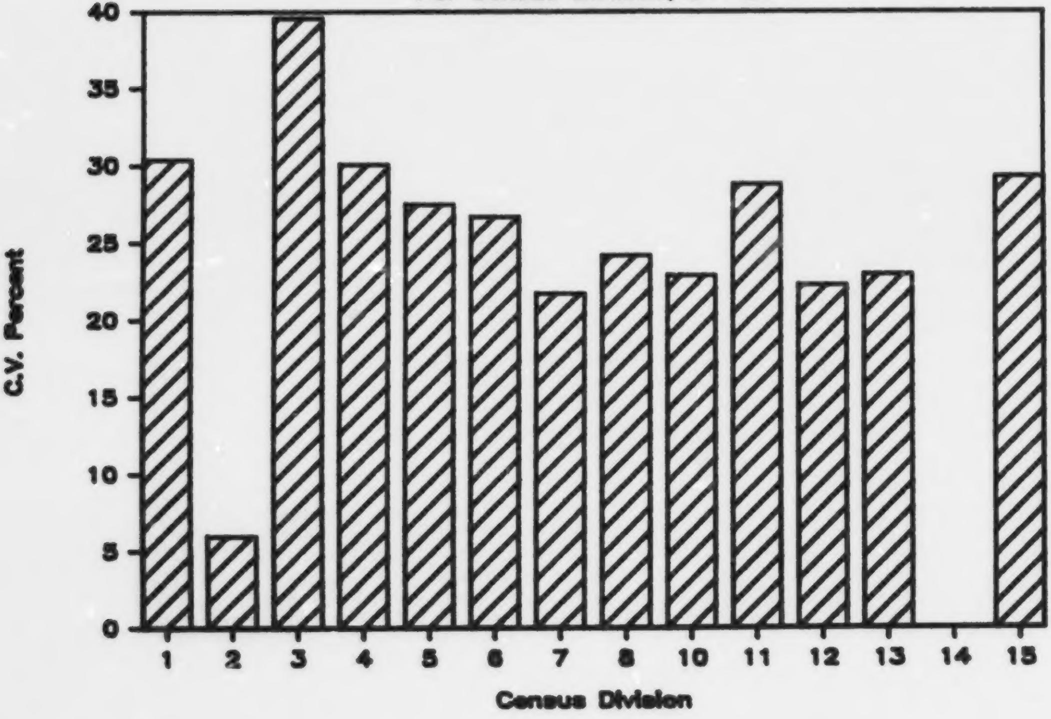
Per Census Division, 81–84



C.W.B. AVE. REPORTS FOR RYE

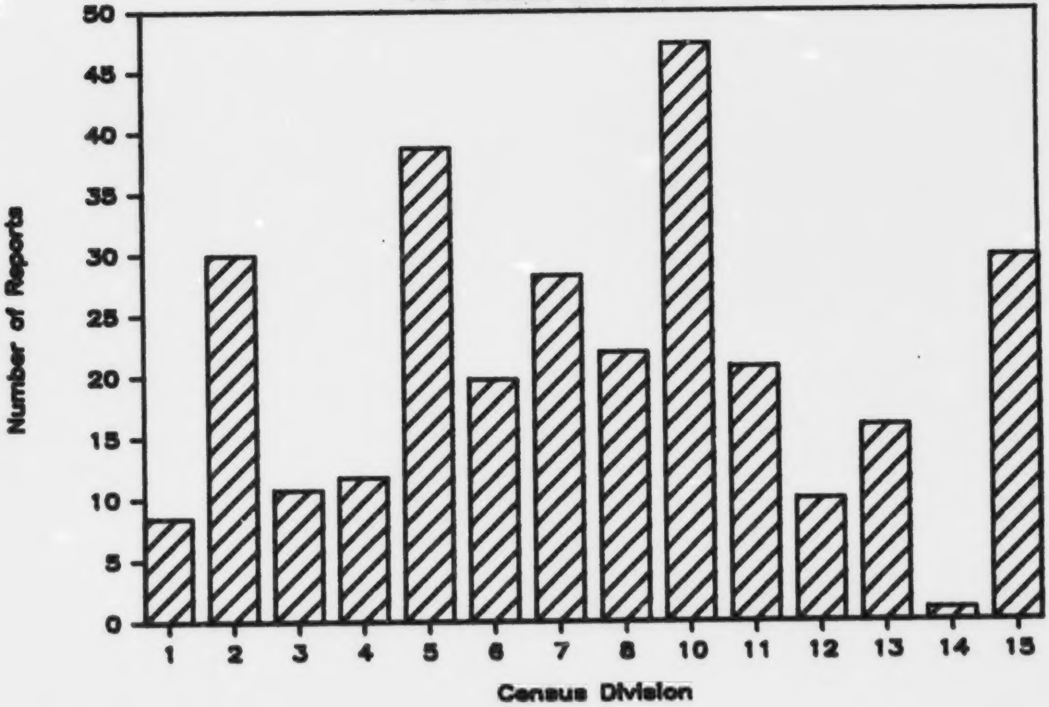
Per Census Division, 81–84


C.W.B. AVE. YIELDS FOR CANOLA
Per Census Division, 81–84


C.W.B. AVE. C.V. FOR CANOLA
Per Census Division, 81–84

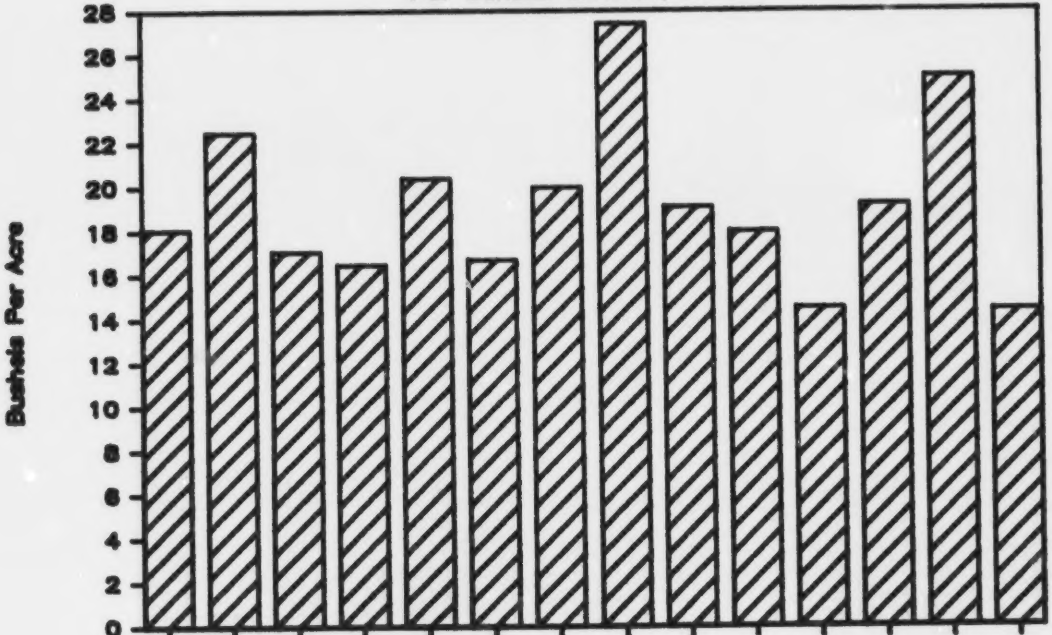
C.W.B. AVE. REPORTS FOR CANOLA

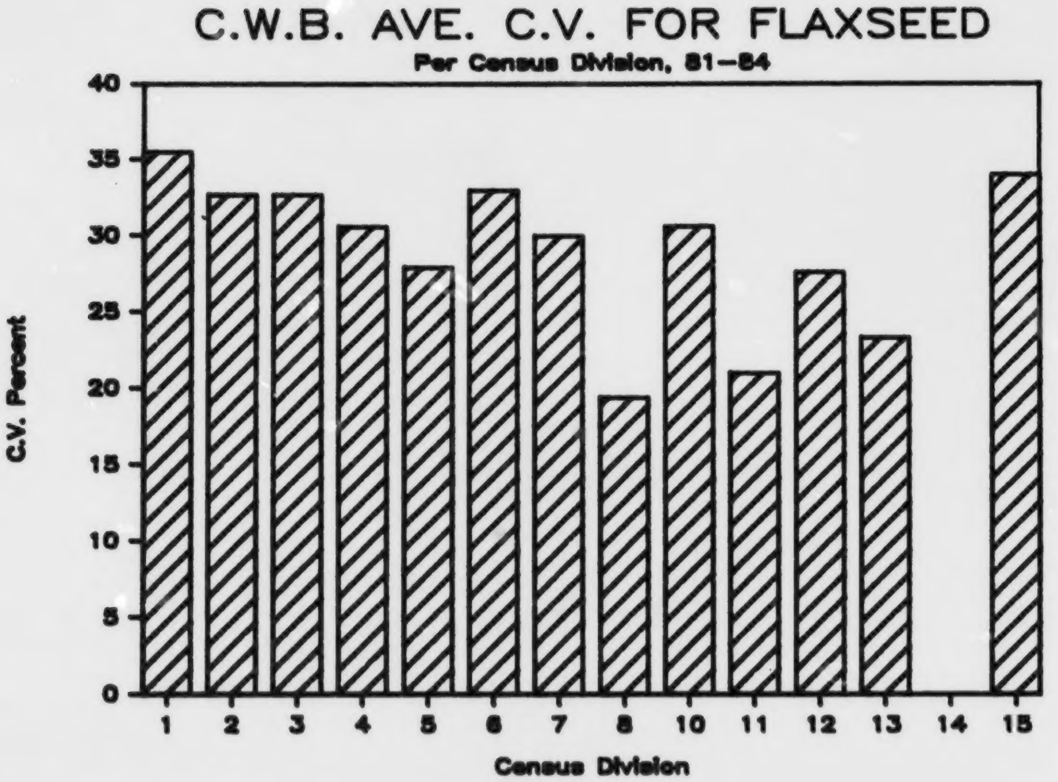
Per Census Division, 81–84

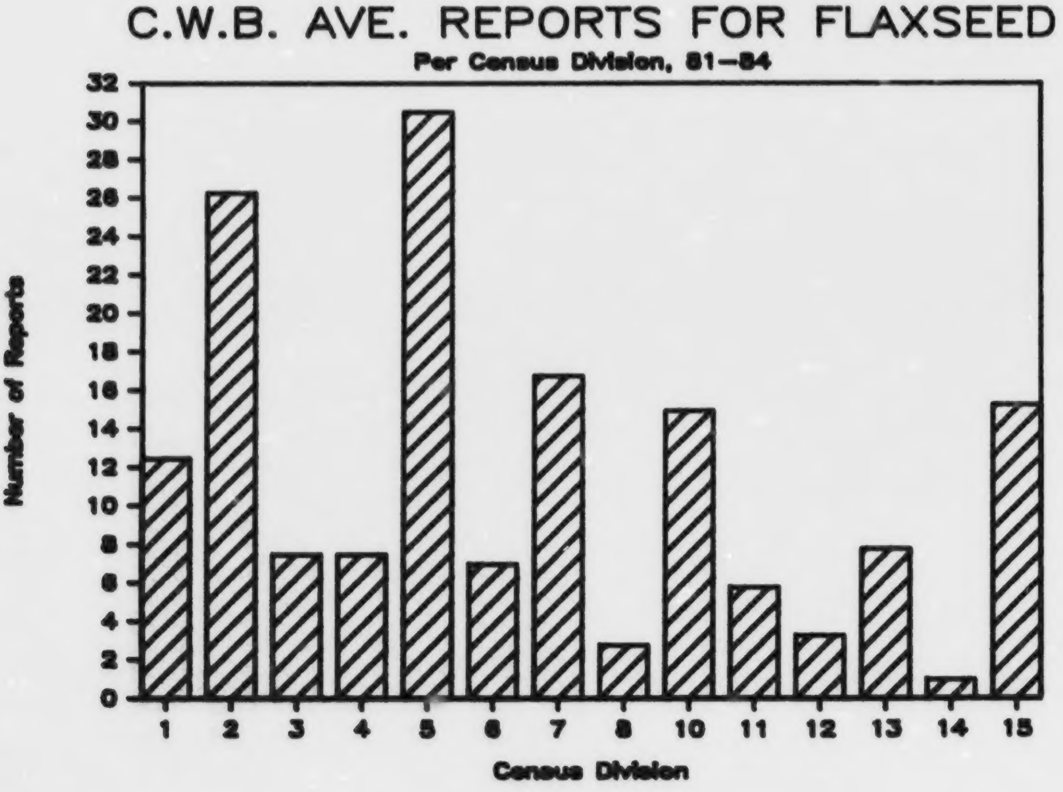


C.W.B. AVE. YIELDS FOR FLAXSEED

Per Census Division, 81–84




C.W.B. AVE. C.V. FOR FLAXSEED
Per Census Division, 81–84
C.V. Percent
0
5
10
15
20
25
30
35
40
1
2
3
4
5
6
7
8
10
11
12
13
14
15
Census Division


C.W.B. AVE. REPORTS FOR FLAXSEED
Per Census Division, 81–84
Number of Reports
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
1
2
3
4
5
6
7
8
10
11
12
13
14
15
Census Division

B. i) Yield Estimates by Region, 1974 - 1984

ii) 4-Year Average of Yield, CV and Number of Reports, by Region, 1981 - 1984

Subsection IIB Highlights

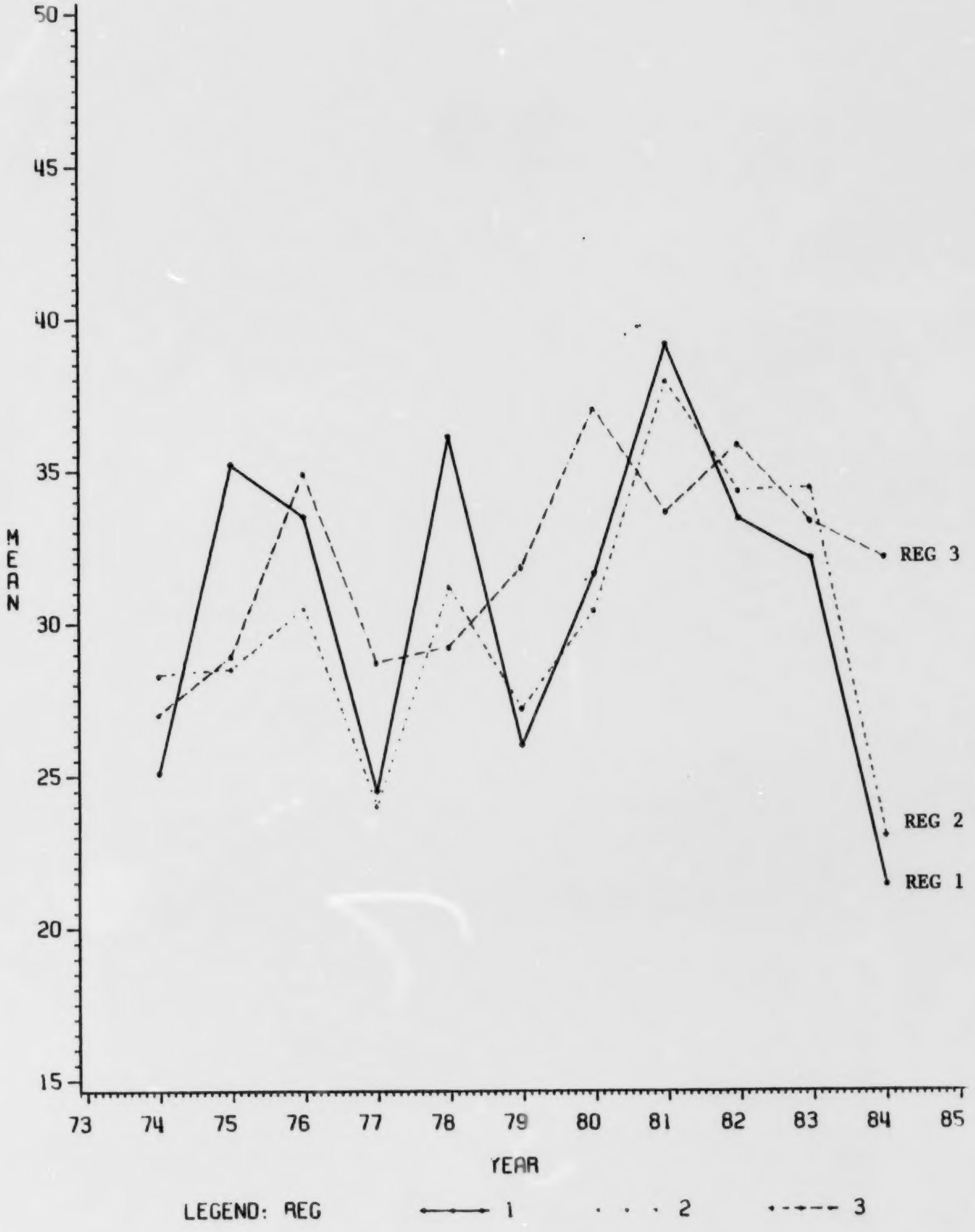
Subsection IIB follows the same format as subsection IIA. However, estimates are shown for Regions instead of CDs. (See map on p. vii.) Annual yields are outlined for the major crops for 1974 to 1984, inclusive. Four-year average yield, CV and sample size data are also provided.

Wheat yields were down in all but Region 5 in 1984. Oats yields declined in Regions 1, 2, 3 and 6 in 1984, while Regions 4 and 5 showed increases. Barley and canola yields showed strong declines in Regions 1 and 2 in 1984 although the balance of the province showed improved yields over 1983.

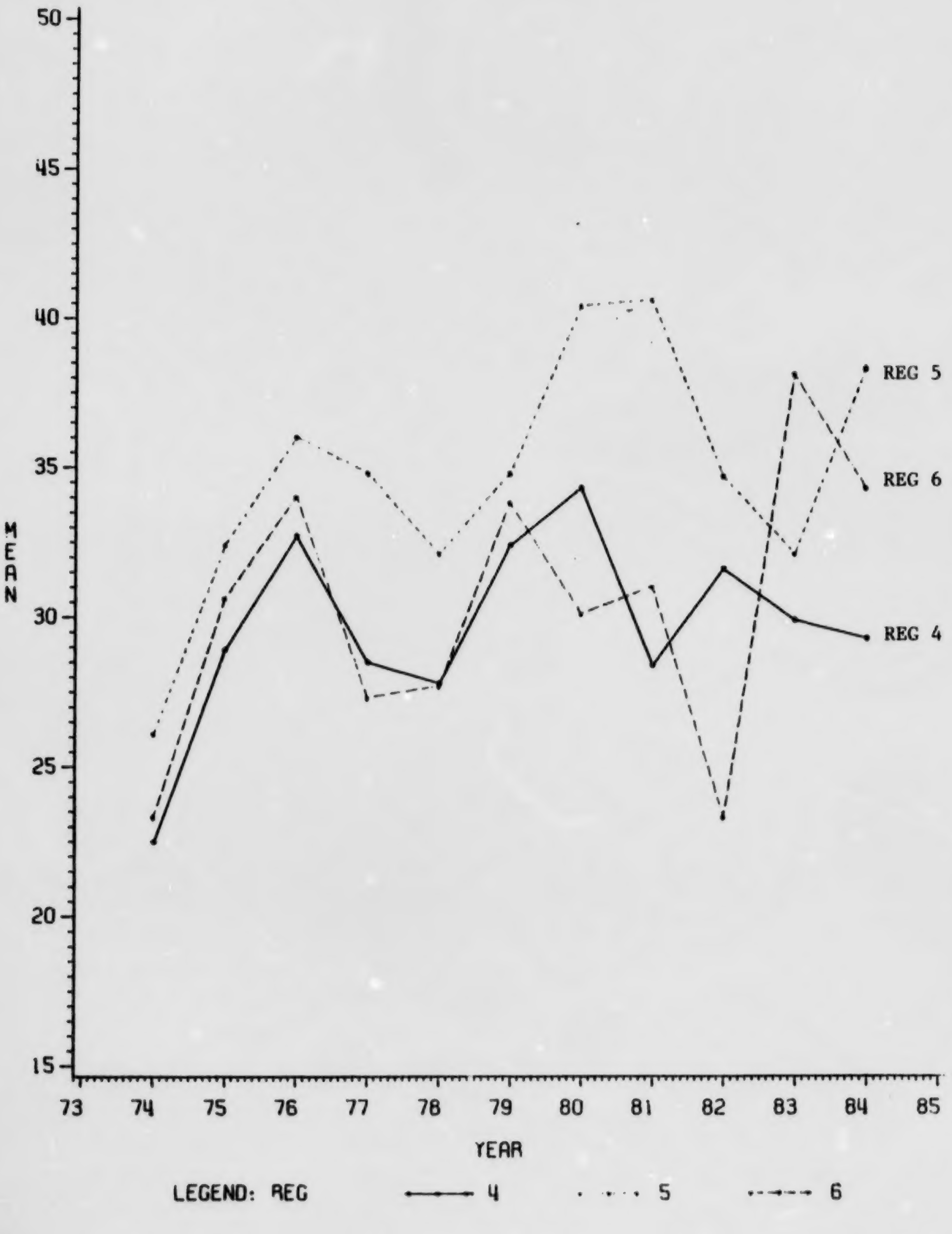
Based on this data, CWRS wheat has the highest average 4-year yield in Region 5. Regional differences are not great however, with a range of 29 to 37 bushels per acre. Region 5 also generates the highest oats yields although Regional differences are again small. Oats yields range from 57 to 69 bushels per acre. Average 4-year barley yields are the highest in Region 1 although the other Regions follow closely. Rye yields are highest in Region 2. Average canola yields in Regions 1 to 4 are very similar, 22 to 23 bushels per acre. Region 6 has the lowest canola yields, about 16 bushels per acre. Flaxseed tends to yield highest in Region 3, closely followed by Regions 1 and 2.

The CVs were expected to be quite high because the Regions are large and diverse. The CV for wheat was quite consistent, between 18 and 24% for all Regions. Conversely, barley and oats data for Region 1 were quite variable, with a CV of about 35% in both cases. Data for Region 4 was more consistent, yielding a CV of under 20%.

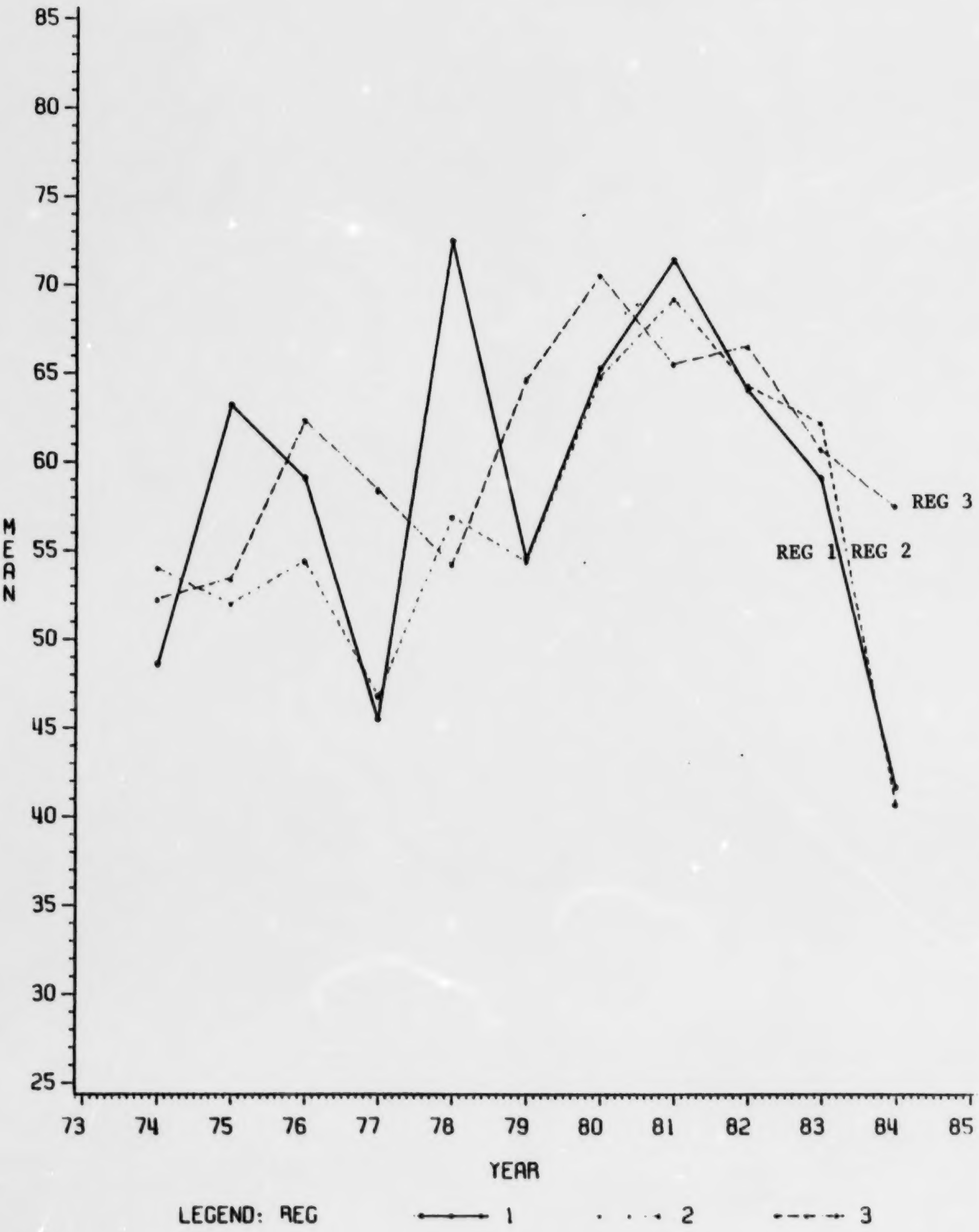
AVERAGE YIELDS FOR WHEAT, PER REGION, 74-84



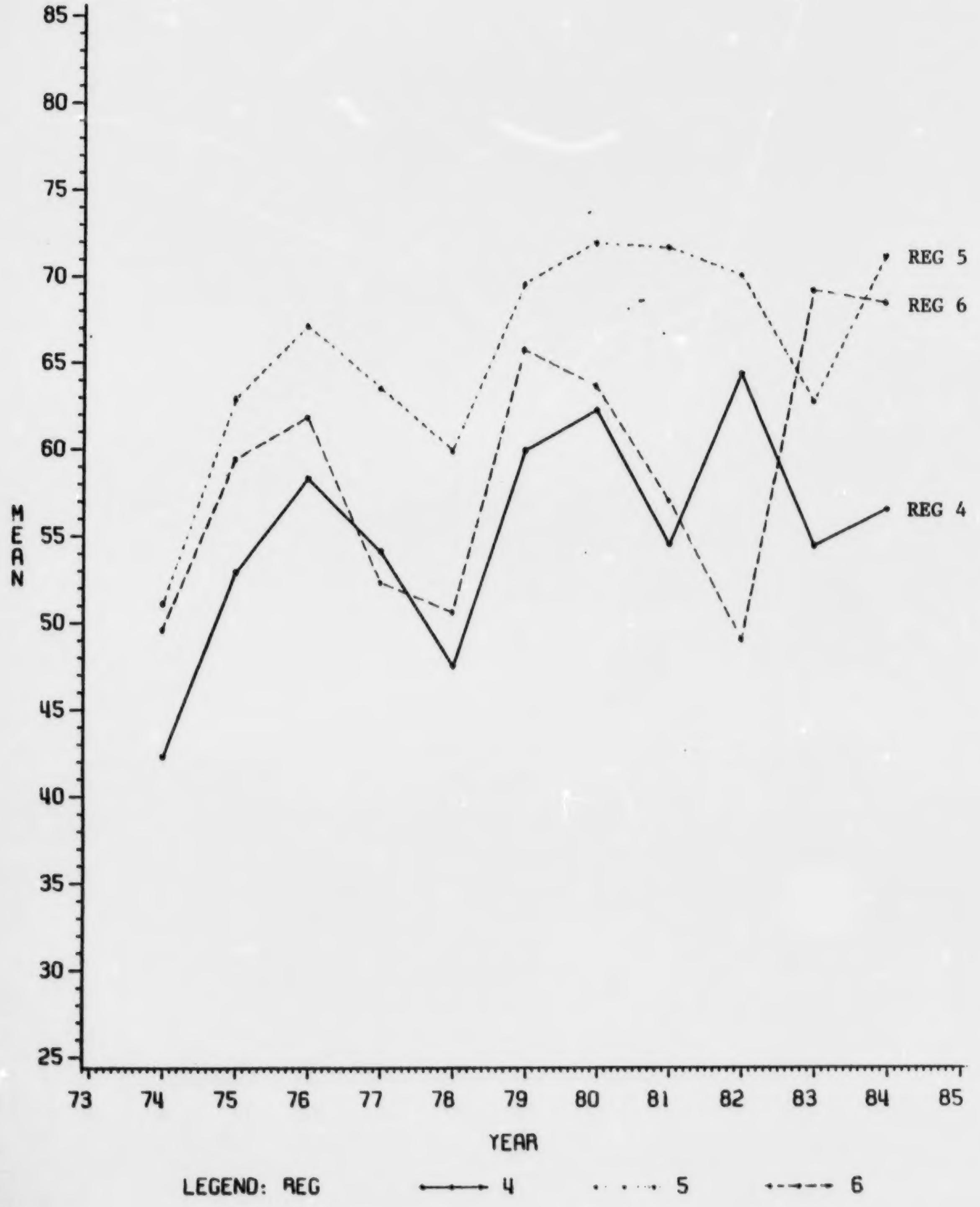
AVERAGE YIELDS FOR WHEAT, PER REGION, 74–84



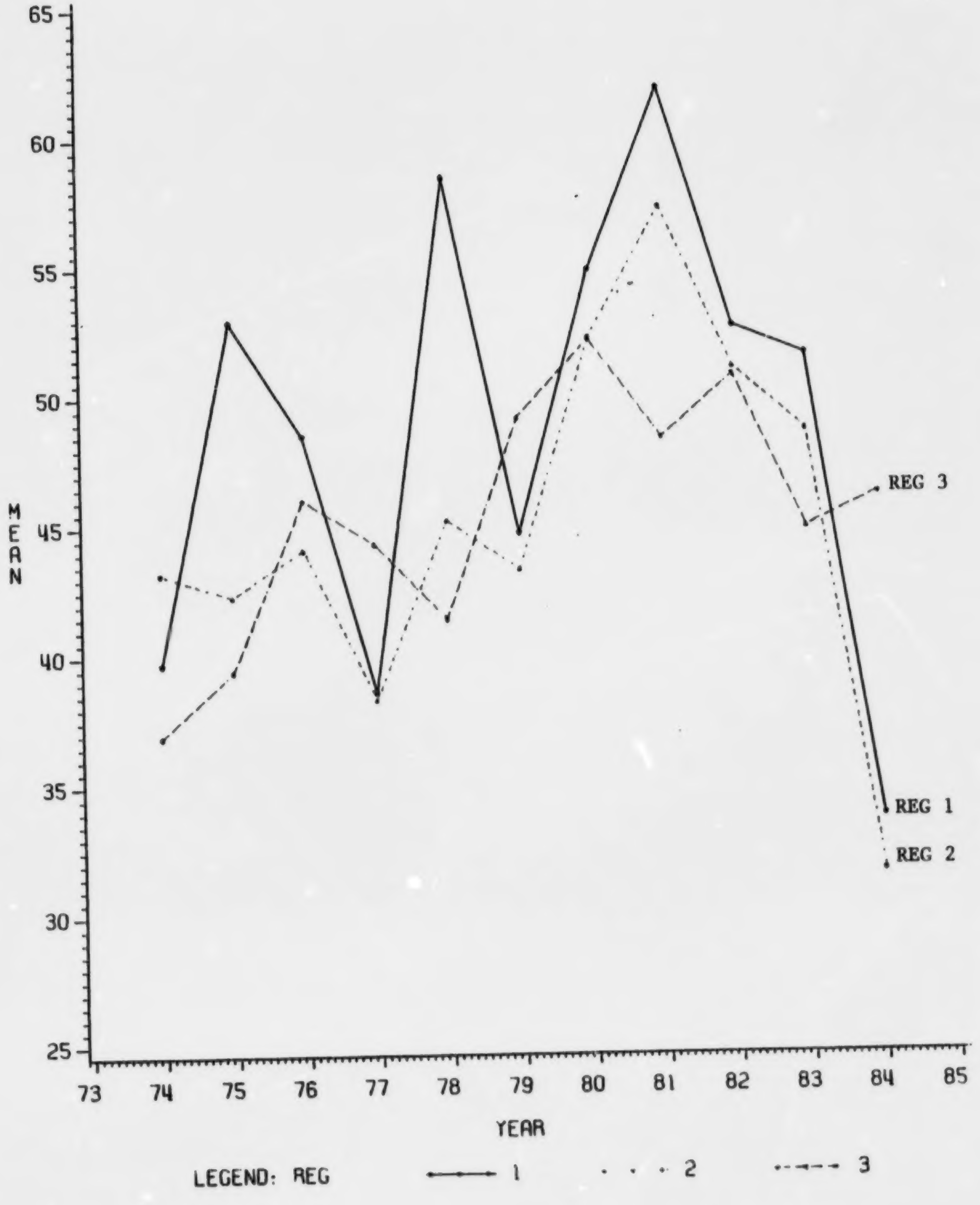
AVERAGE YIELDS FOR OATS, PER REGION, 74–84



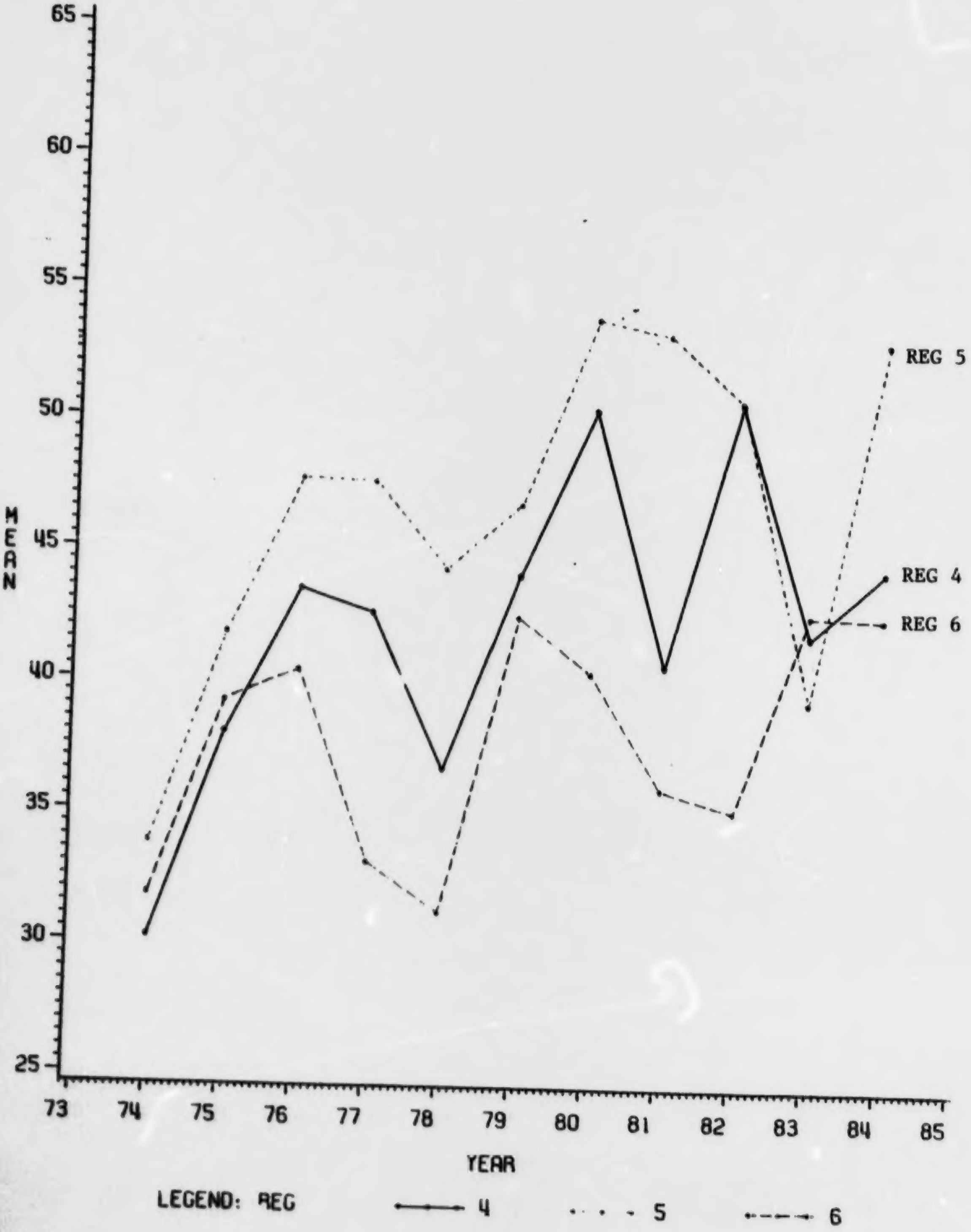
AVERAGE YIELDS FOR OATS, PER REGION, 74–84



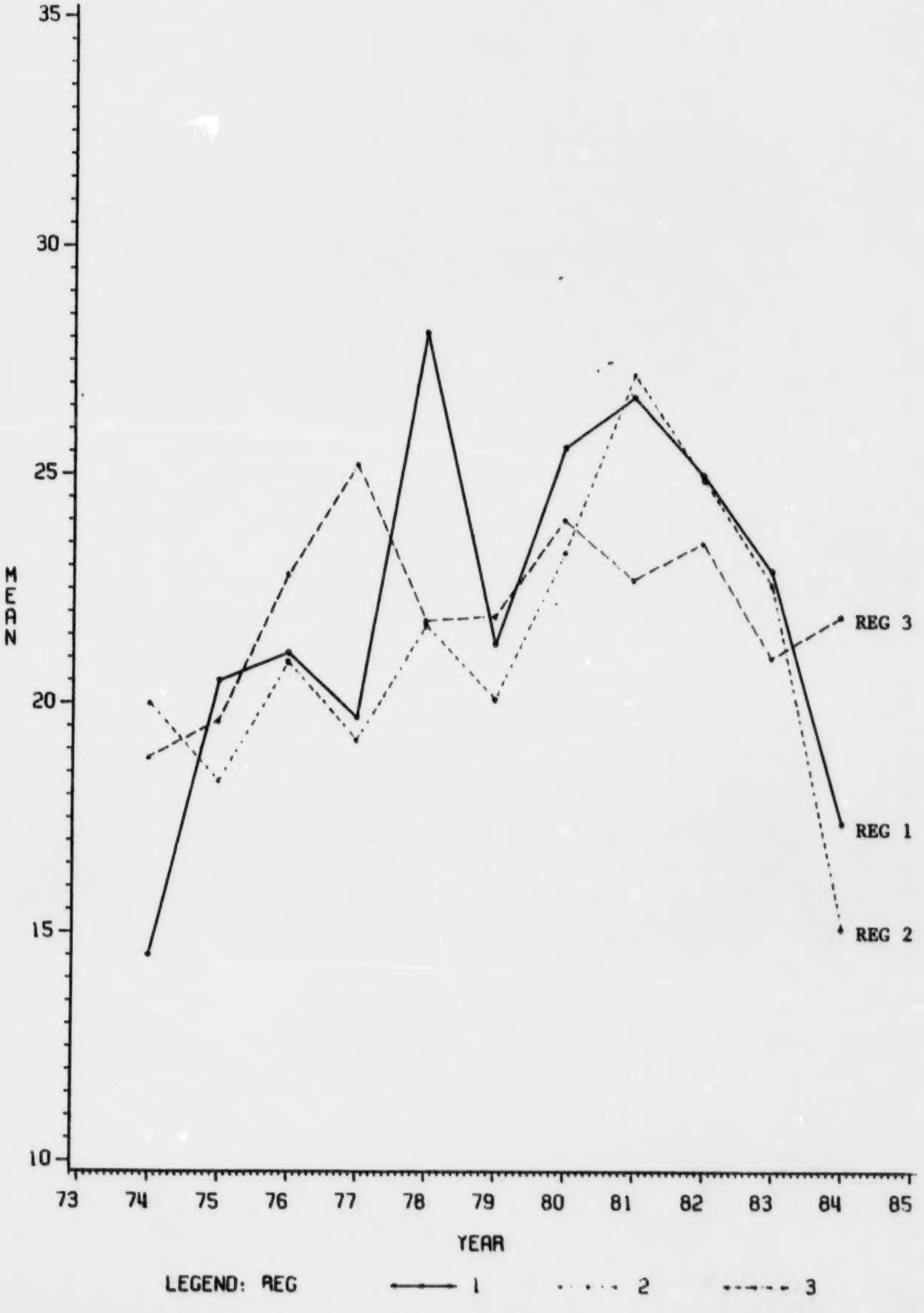
AVERAGE YIELDS FOR BARLEY PER REGION, 74–84



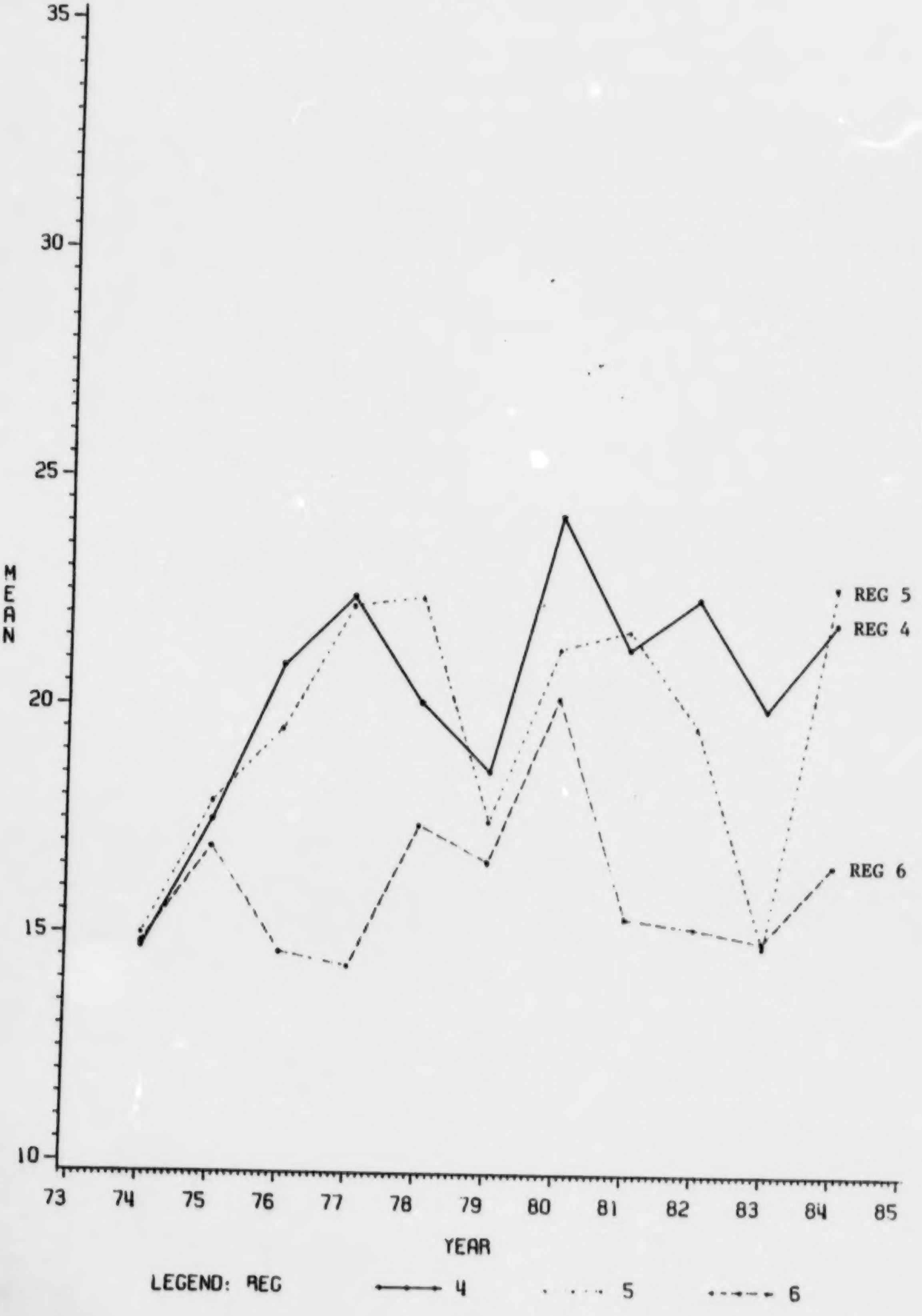
AVERAGE YIELDS FOR BARLEY PER REGION, 74–84

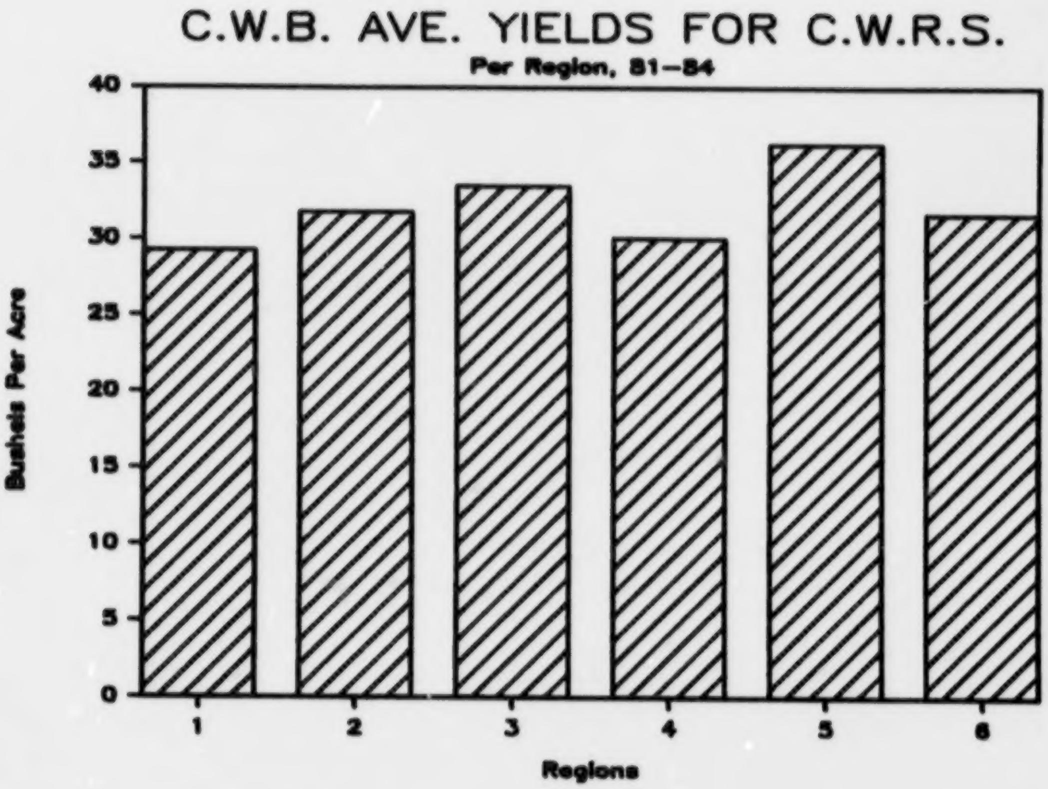


AVERAGE YIELDS FOR CANOLA, PER REGION, 74–84

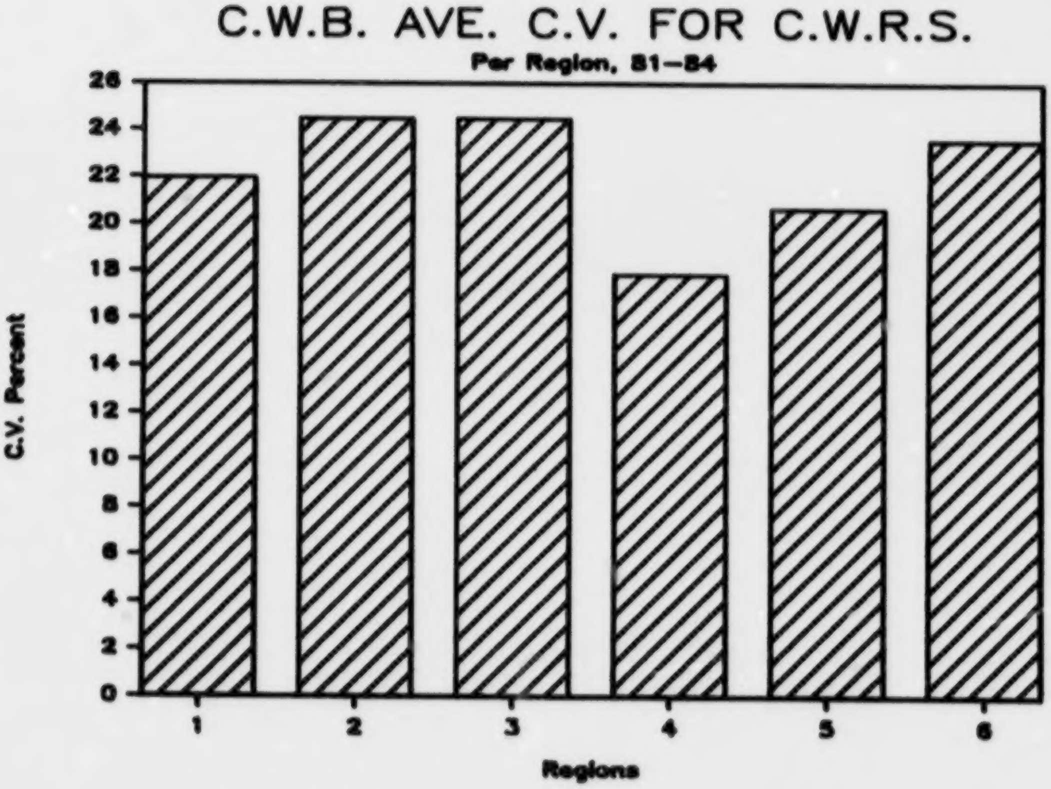


AVERAGE YIELDS FOR CANOLA, PER REGION, 74-84




C.W.B. AVE. YIELDS FOR C.W.R.S.

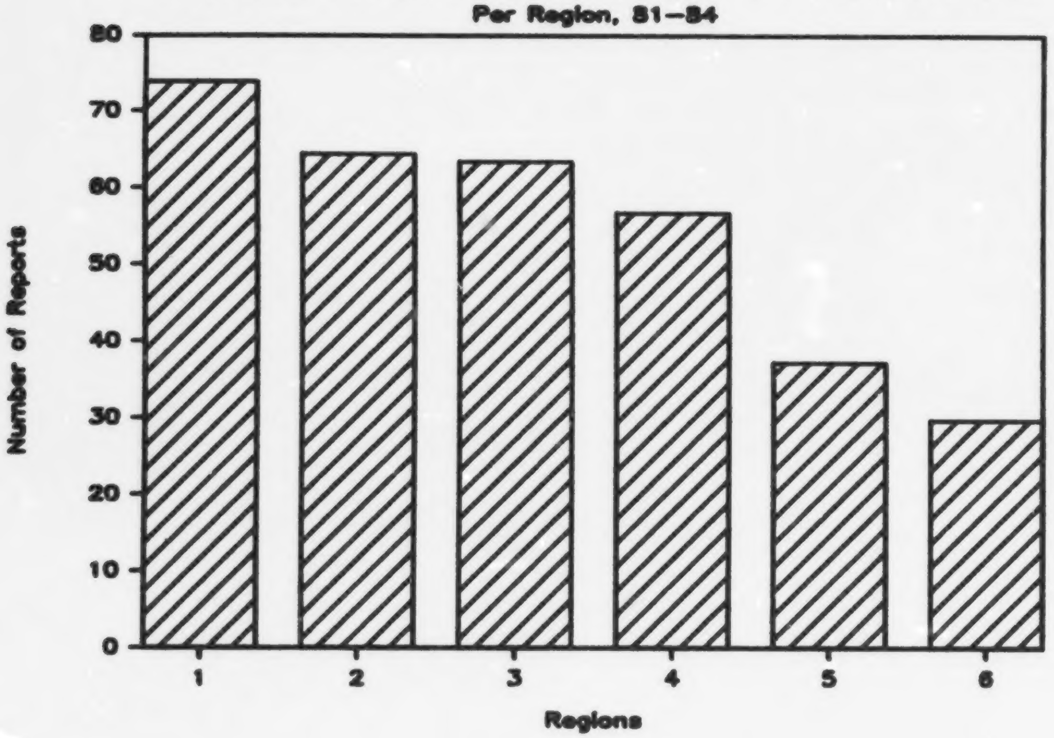
Per Region, 81–84


C.W.B. AVE. C.V. FOR C.W.R.S.

Per Region, 81–84

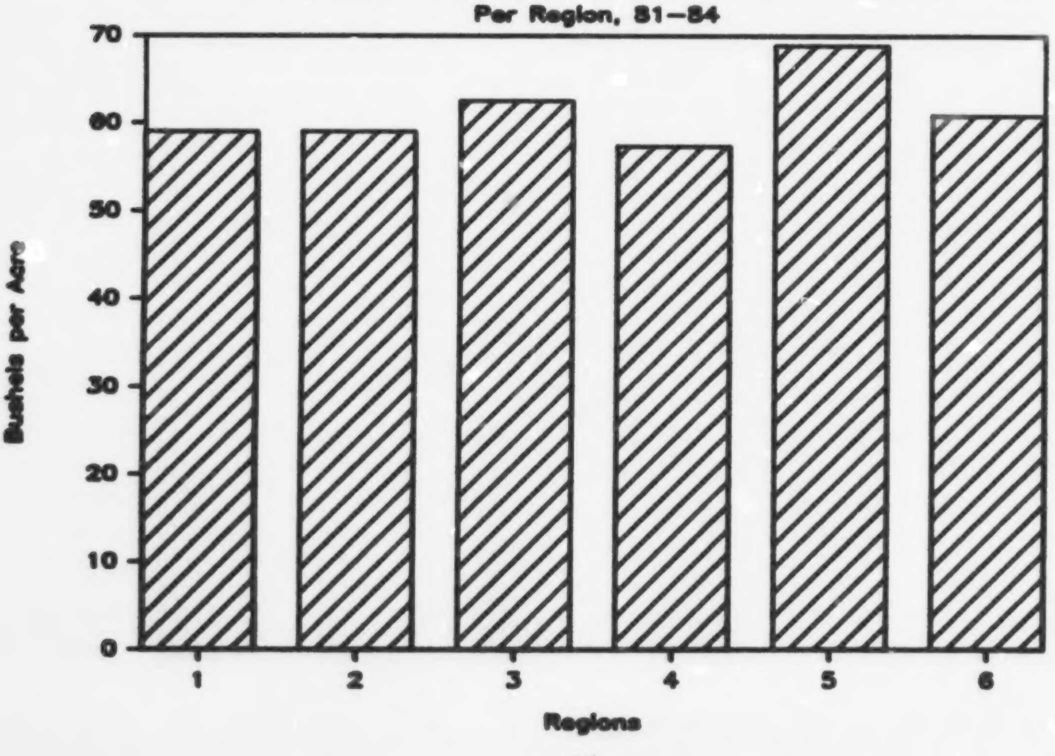
C.W.B. AVE. REPORTS FOR C.W.R.S.

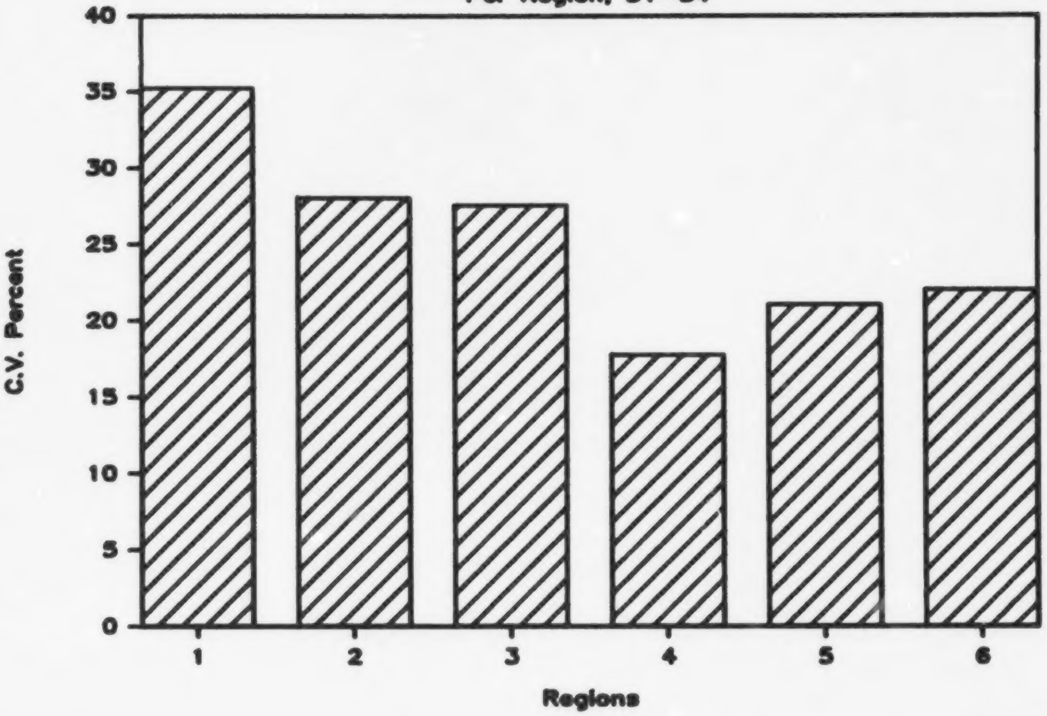
Per Region, 81–84



C.W.B. AVE. YIELD FOR OATS

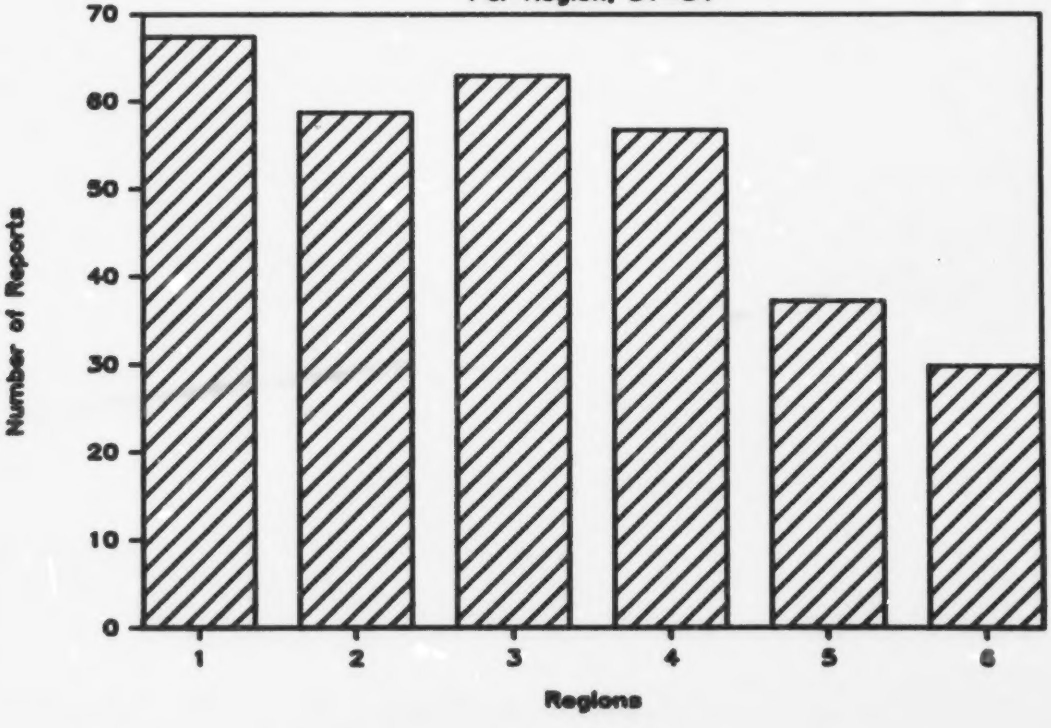
Per Region, 81–84





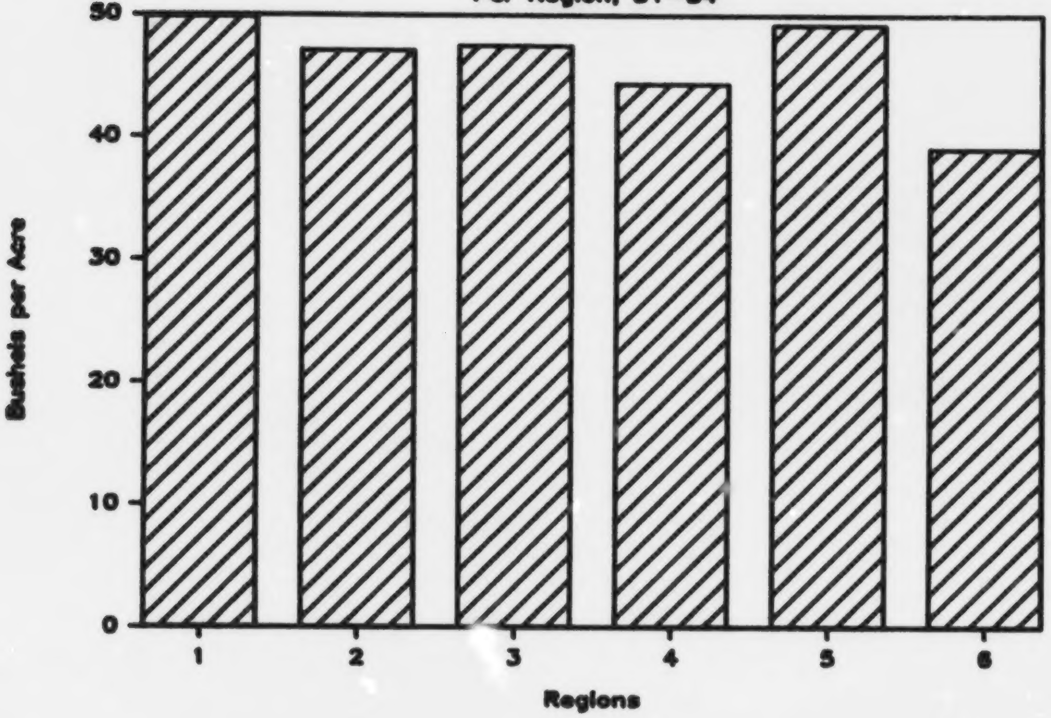
C.W.B. AVE. C.V. FOR OATS

Per Region, 81–84

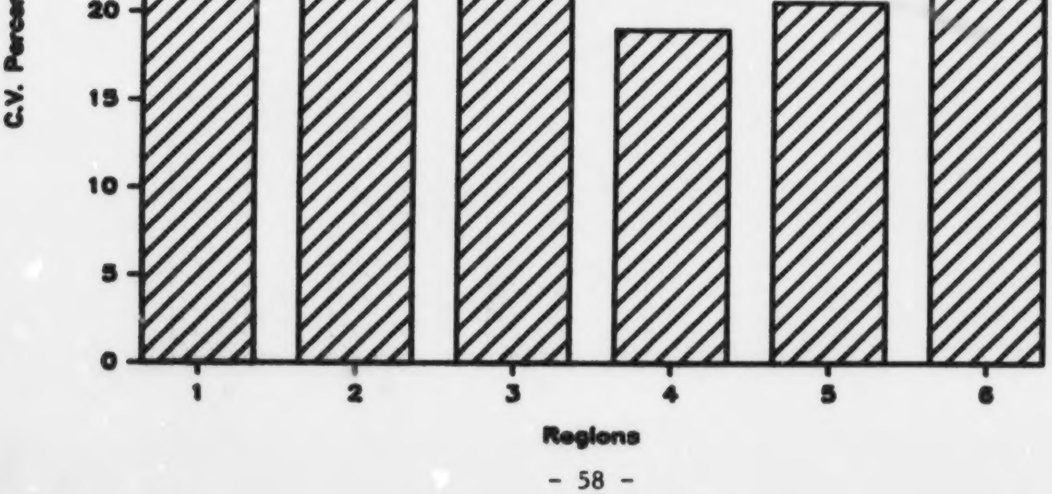


C.W.B. AVE. REPORTS FOR OATS

Per Region, 81–84


C.W.B. AVE. YIELD FOR BARLEY

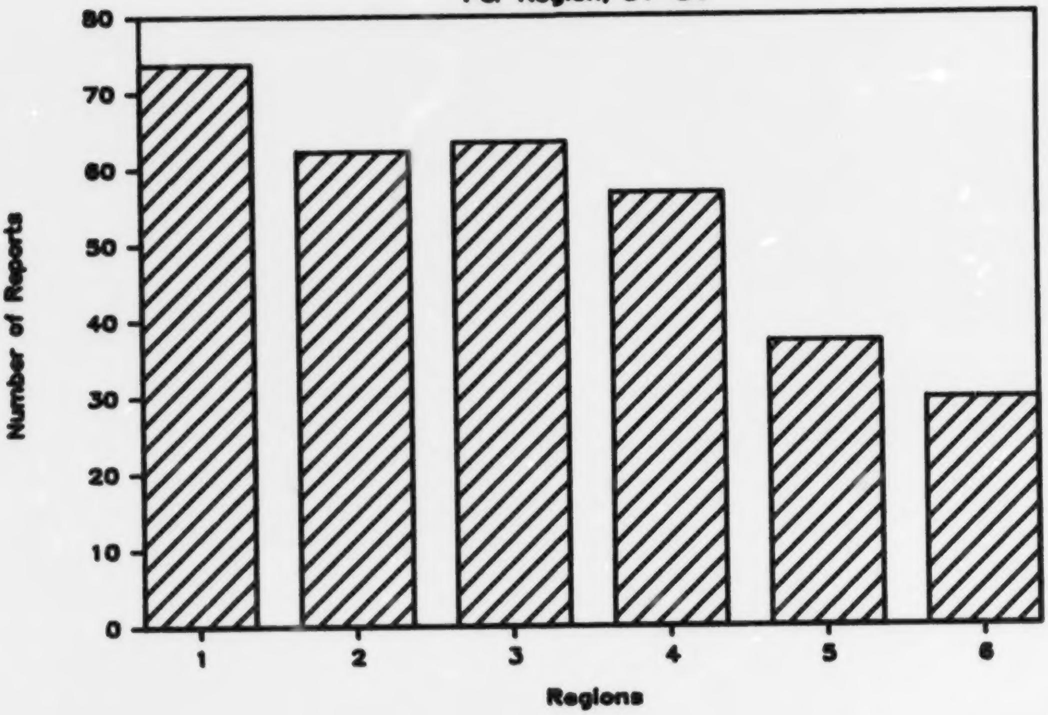
Per Region, 81–84


C.W.B. AVE. C.V. FOR BARLEY

Per Region, 81–84

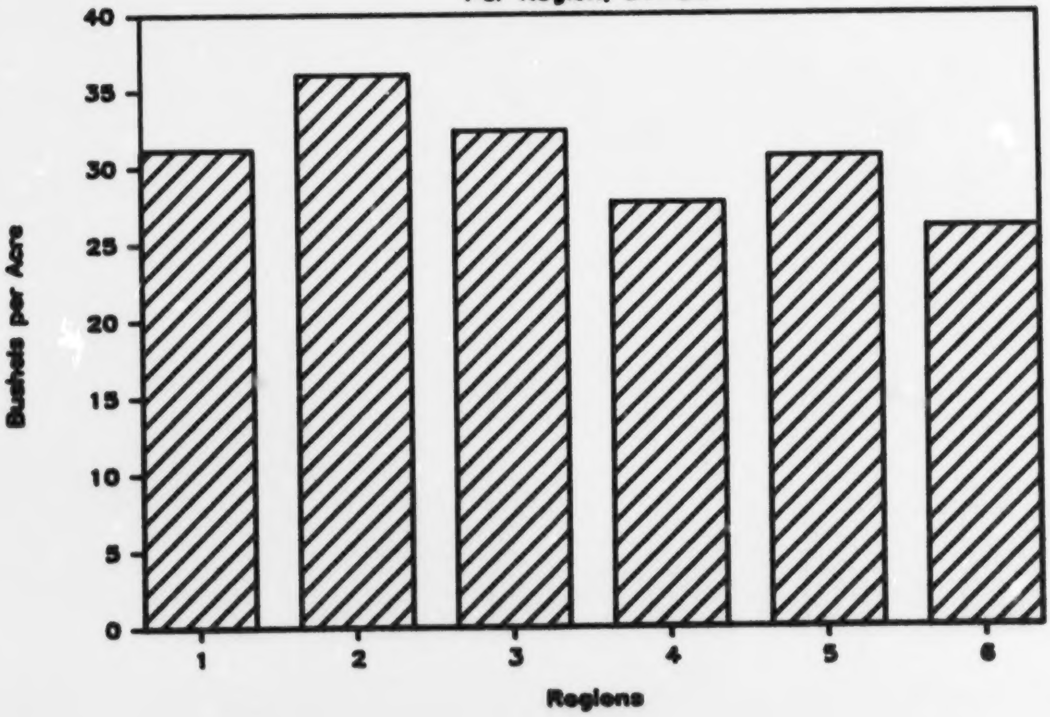
C.W.B. AVE. REPORTS FOR BARLEY

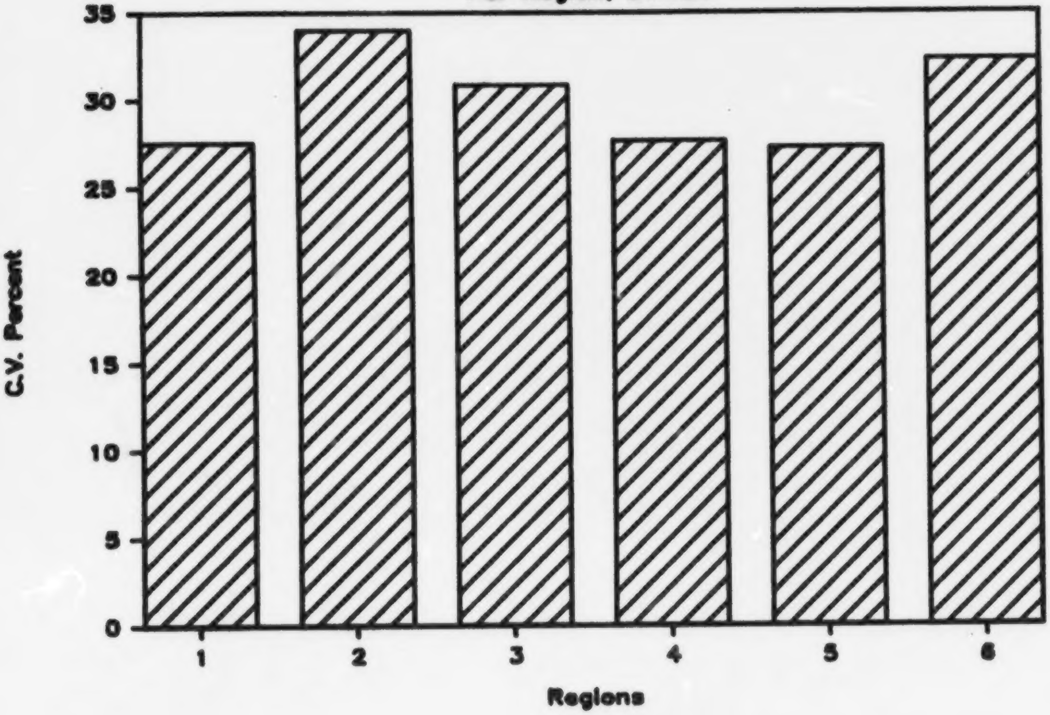
Per Region, 81–84



C.W.B. AVE. YIELD FOR RYE

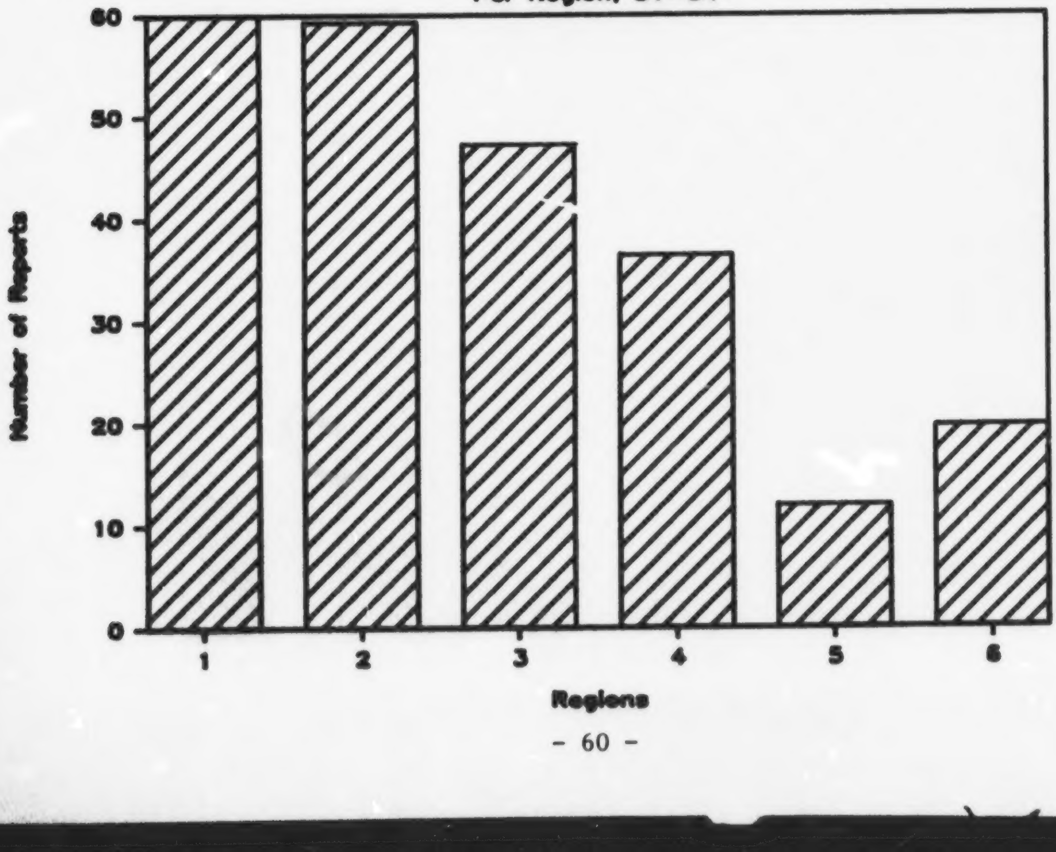
Per Region, 81–84





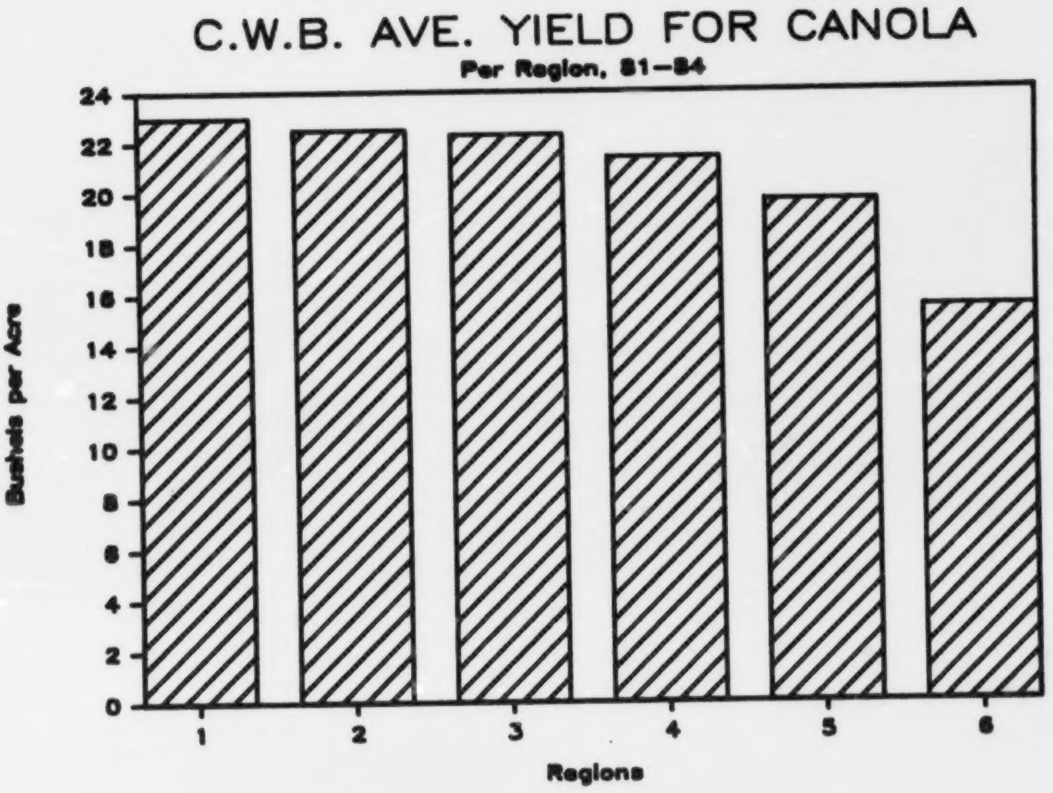
C.W.B. AVE. C.V. FOR RYE

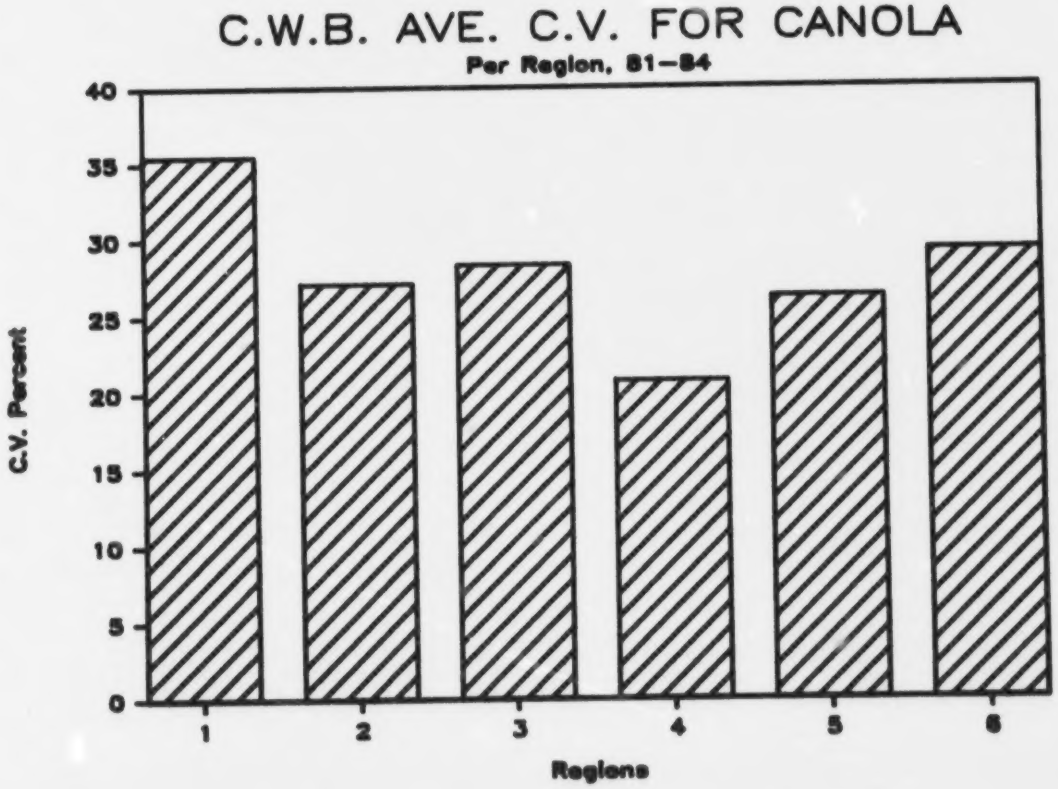
Per Region, 81–84

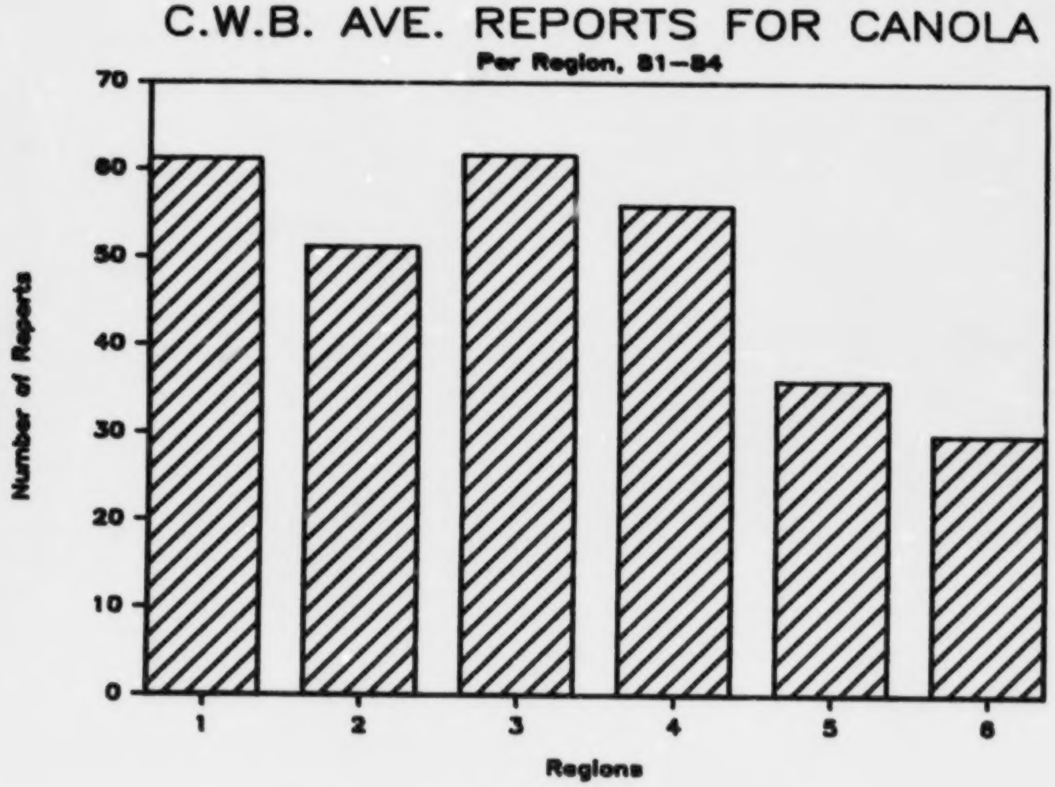


C.W.B. AVE. REPORTS FOR RYE

Per Region, 81–84

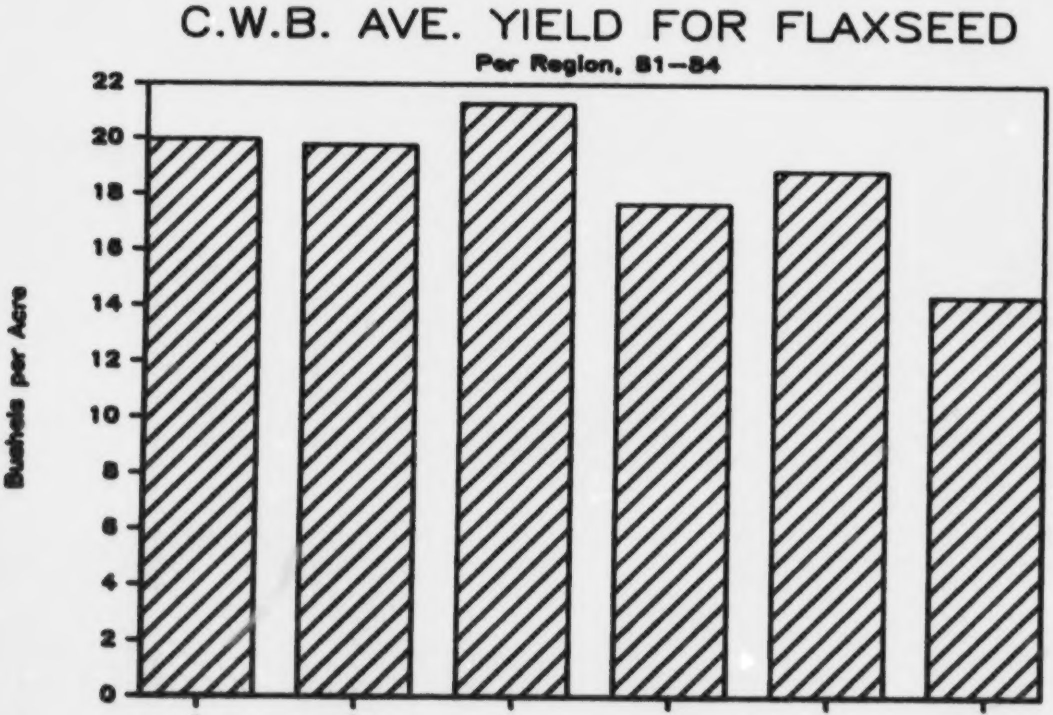

C.W.B. AVE. YIELD FOR CANOLA
Per Region, 81–84
Bushels per Acre
0
2
4
6
8
10
12
14
16
18
20
22
24
1
2
3
4
5
6
Regions


C.W.B. AVE. C.V. FOR CANOLA
Per Region, 81–84
C.V. Percent
0
5
10
15
20
25
30
35
40
1
2
3
4
5
6
Regions



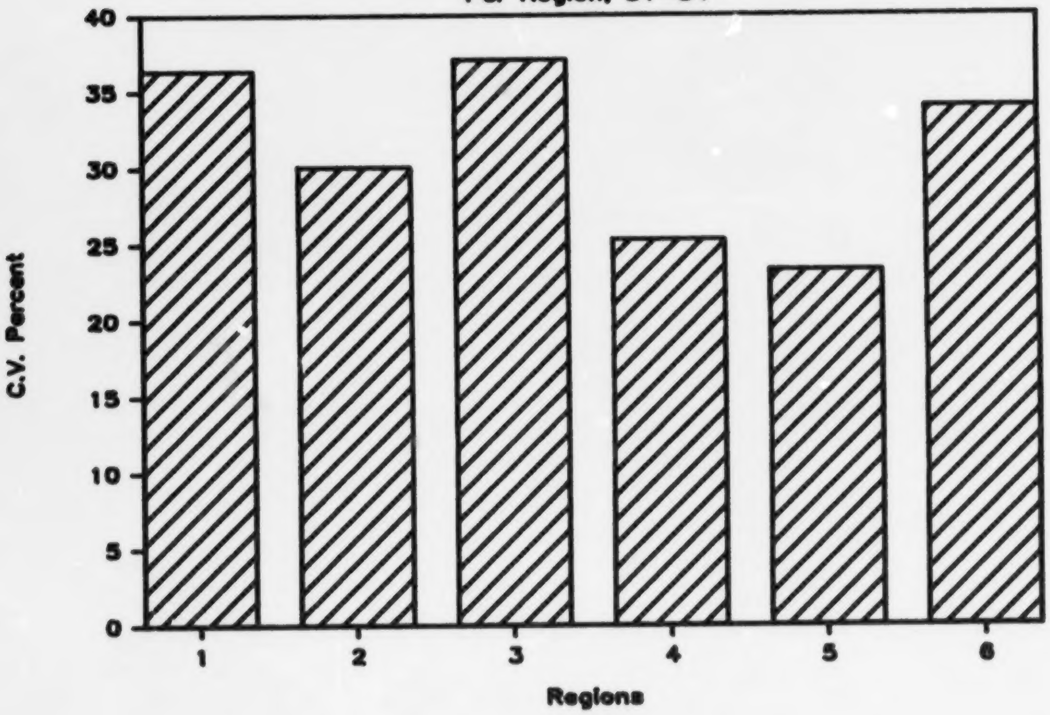
C.W.B. AVE. REPORTS FOR CANOLA

Per Region, 81–84



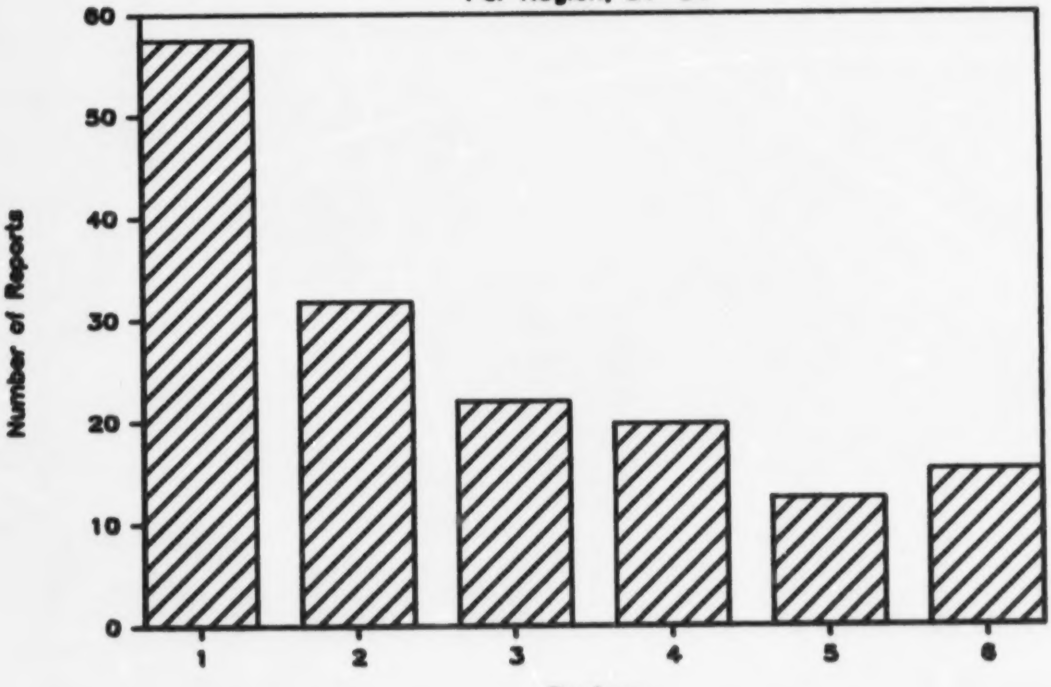
C.W.B. AVE. YIELD FOR FLAXSEED

Per Region, 81–84



C.W.B. AVE. C.V. FOR FLAXSEED

Per Region, 81–84



C.W.B. AVE. REPORTS FOR FLAXSEED

Per Region, 81–84

C. i) Yield Estimates by Agricultural Reporting Area, 1974 - 1984

   ii) 4-Year Average of Yield, CV and Number of Reports, by ARA 1981 - 1984

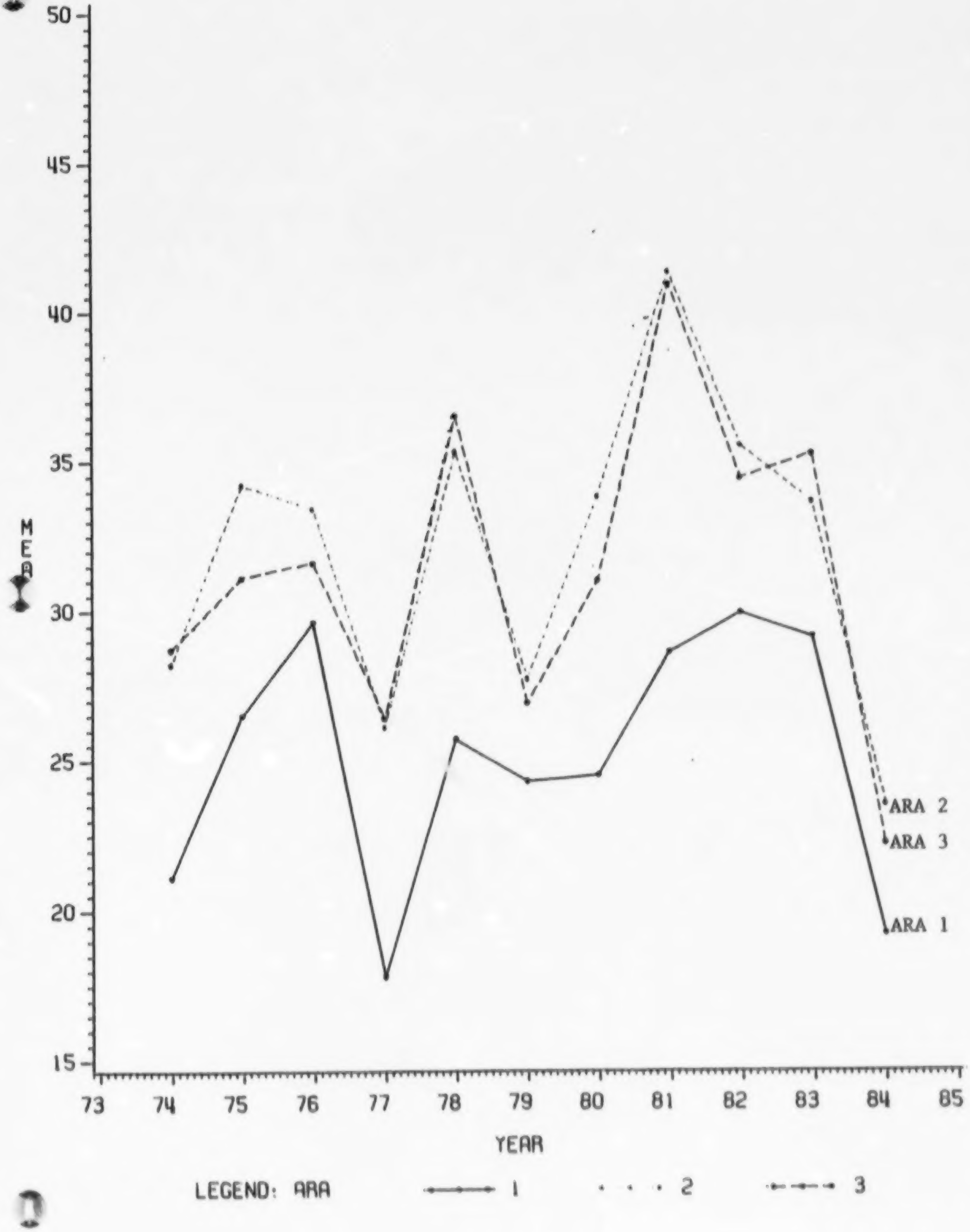
Subsection IIC Highlights

This section uses the same data and follows the same formats as Subsections IIA and IIB. In this case, however, the data is presented by Agricultural Reporting Area (ARA) (see map on page vi).

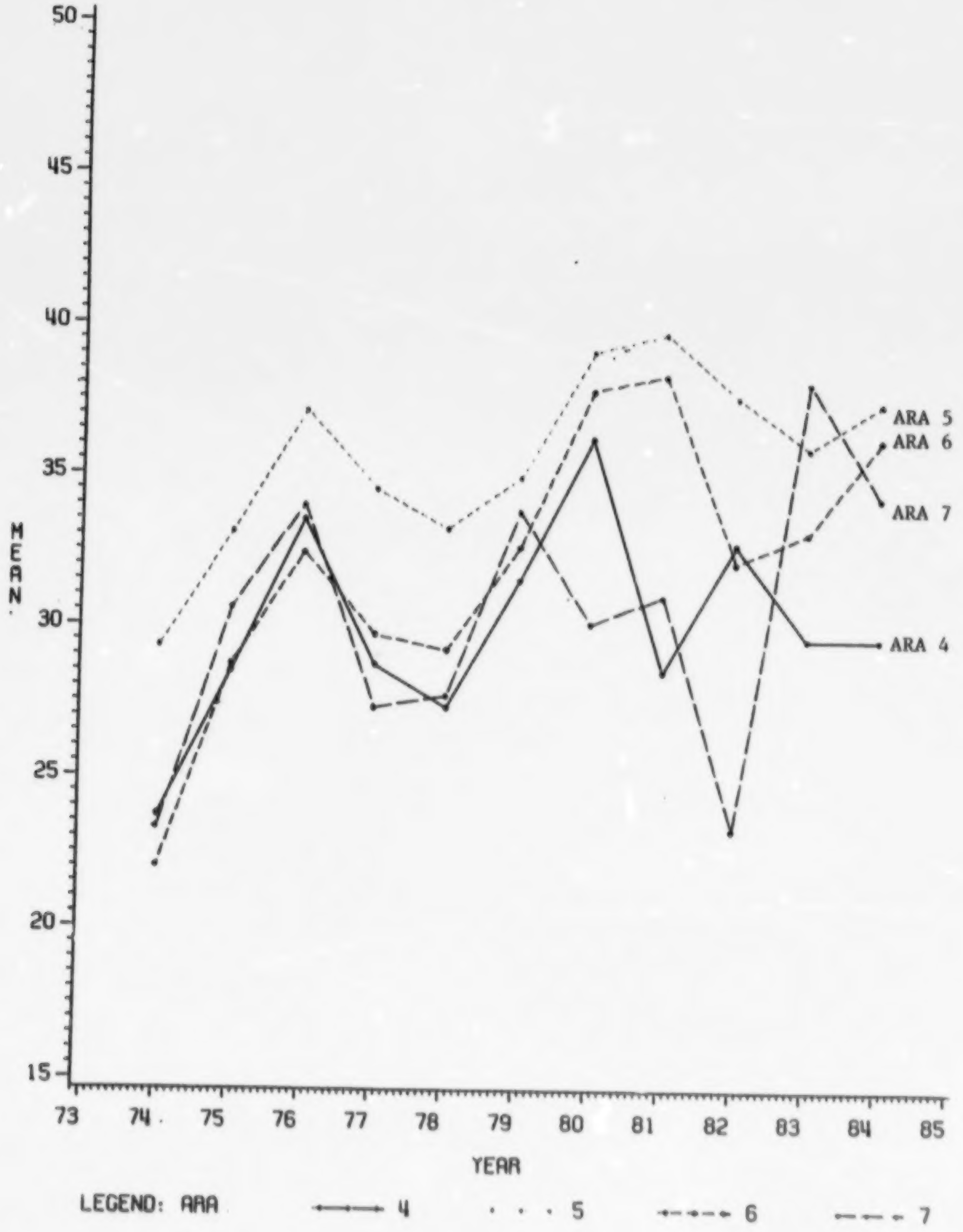
Wheat yields in the three southern ARAs (1, 2 and 3) declined by about 10 bushels per acre between 1983 and 1984. ARA 7 also showed a yield decrease in 1984, likely because of delayed seeding in spring, a wet autumn and early snowfall. The balance of the crops, including oats, barley and canola, follow similar trends. The recent drought in southern Alberta had affected yields of all crops.

There were an average of 20 reports per crop and ARA over the four years studied.

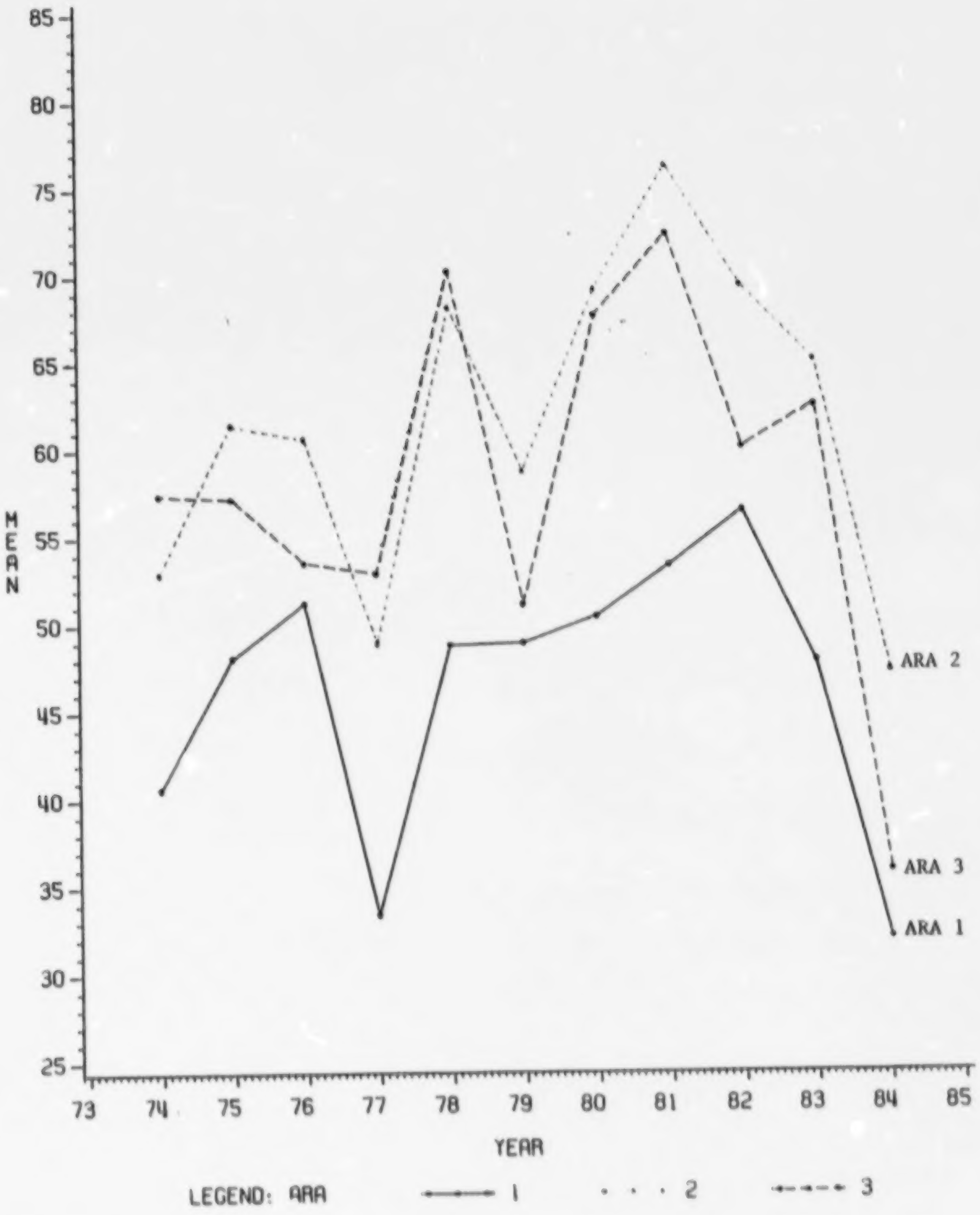
C.W.B. CROP YIELDS FOR WHEAT, PER ARA, 74–84



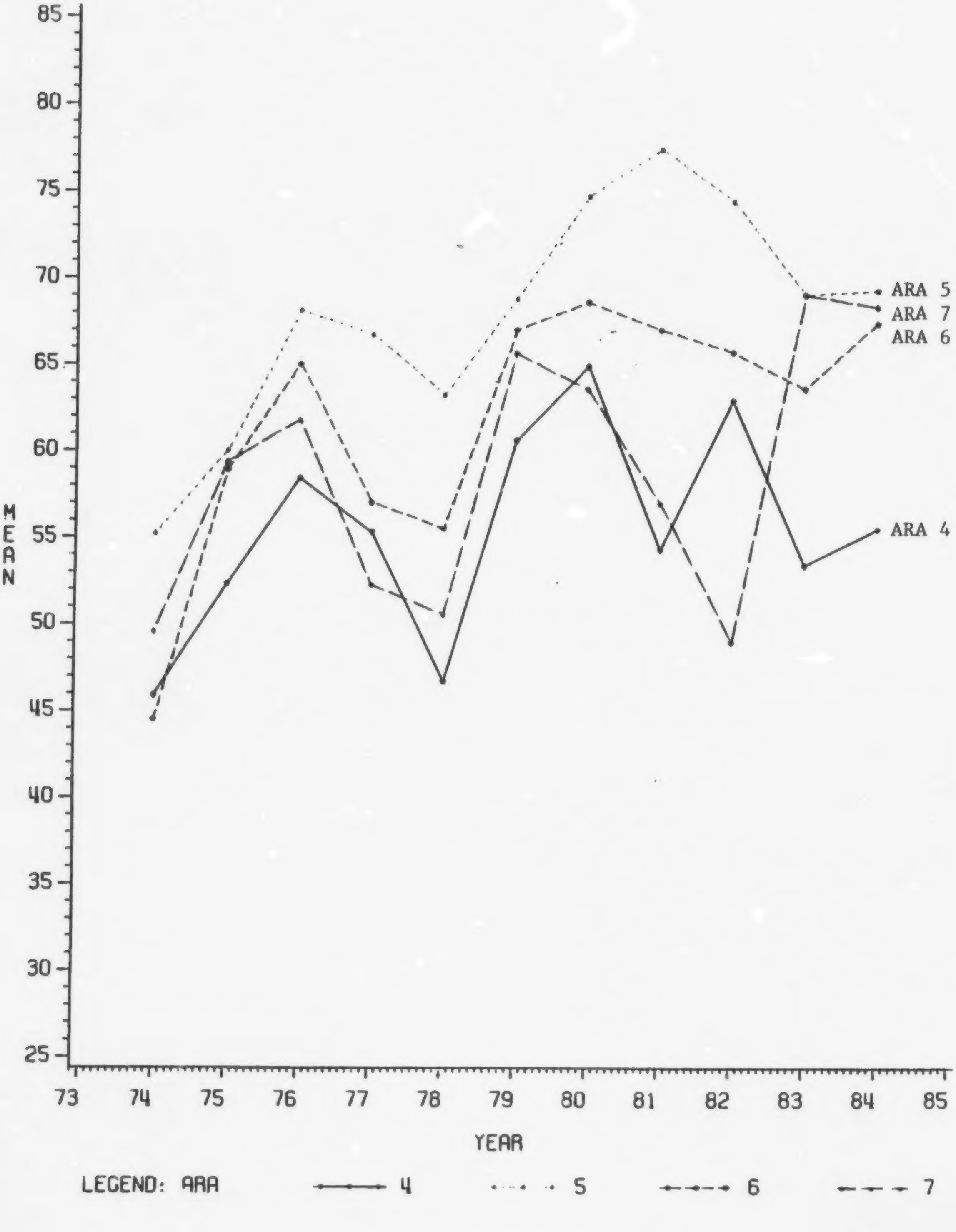
C.W.B. CROP YIELDS FOR WHEAT, PER ARA, 74–84



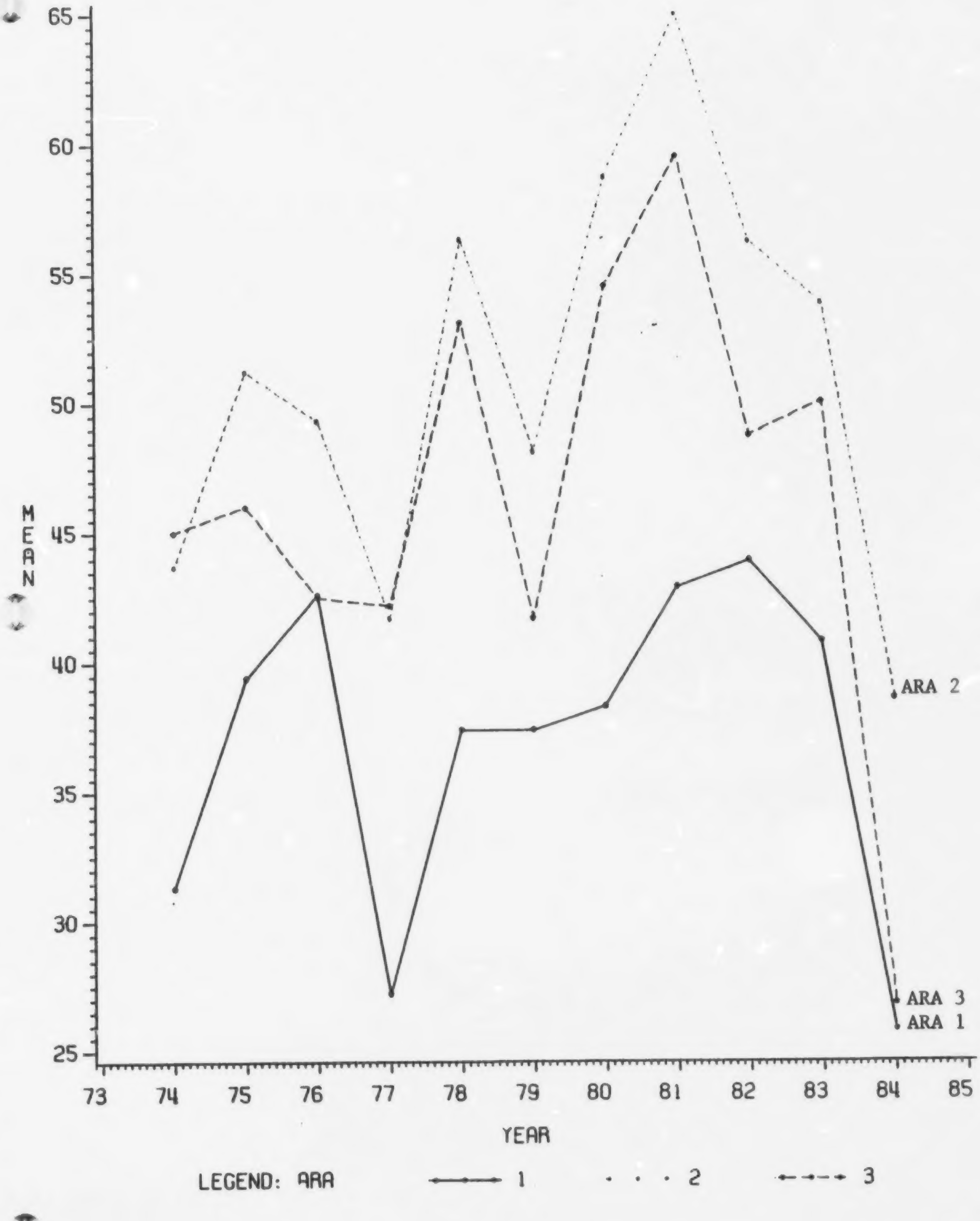
C.W.B. CROP YIELDS FOR OATS, PER ARA, 74−84



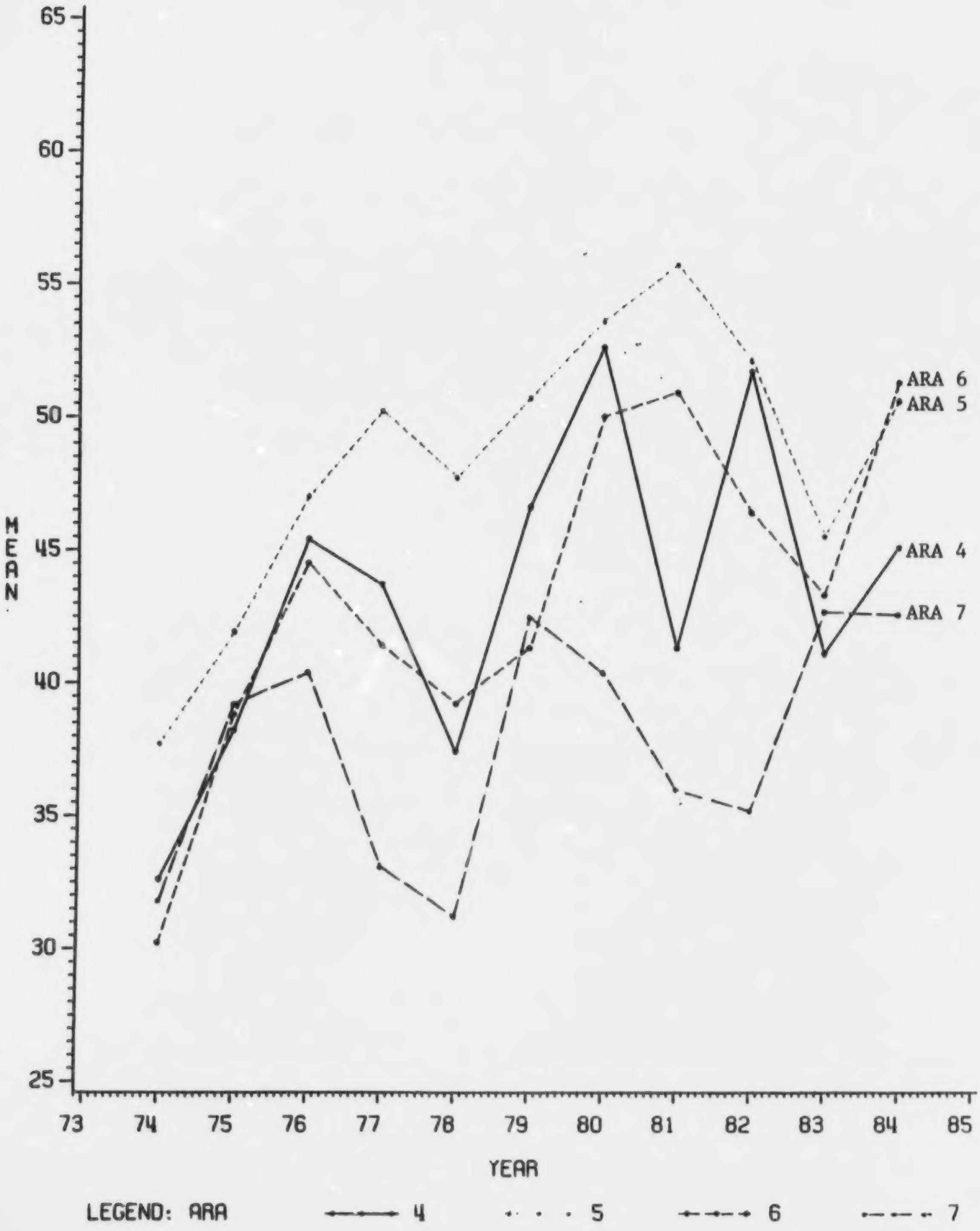
C.W.B. CROP YIELDS FOR OATS, PER ARA, 74–84



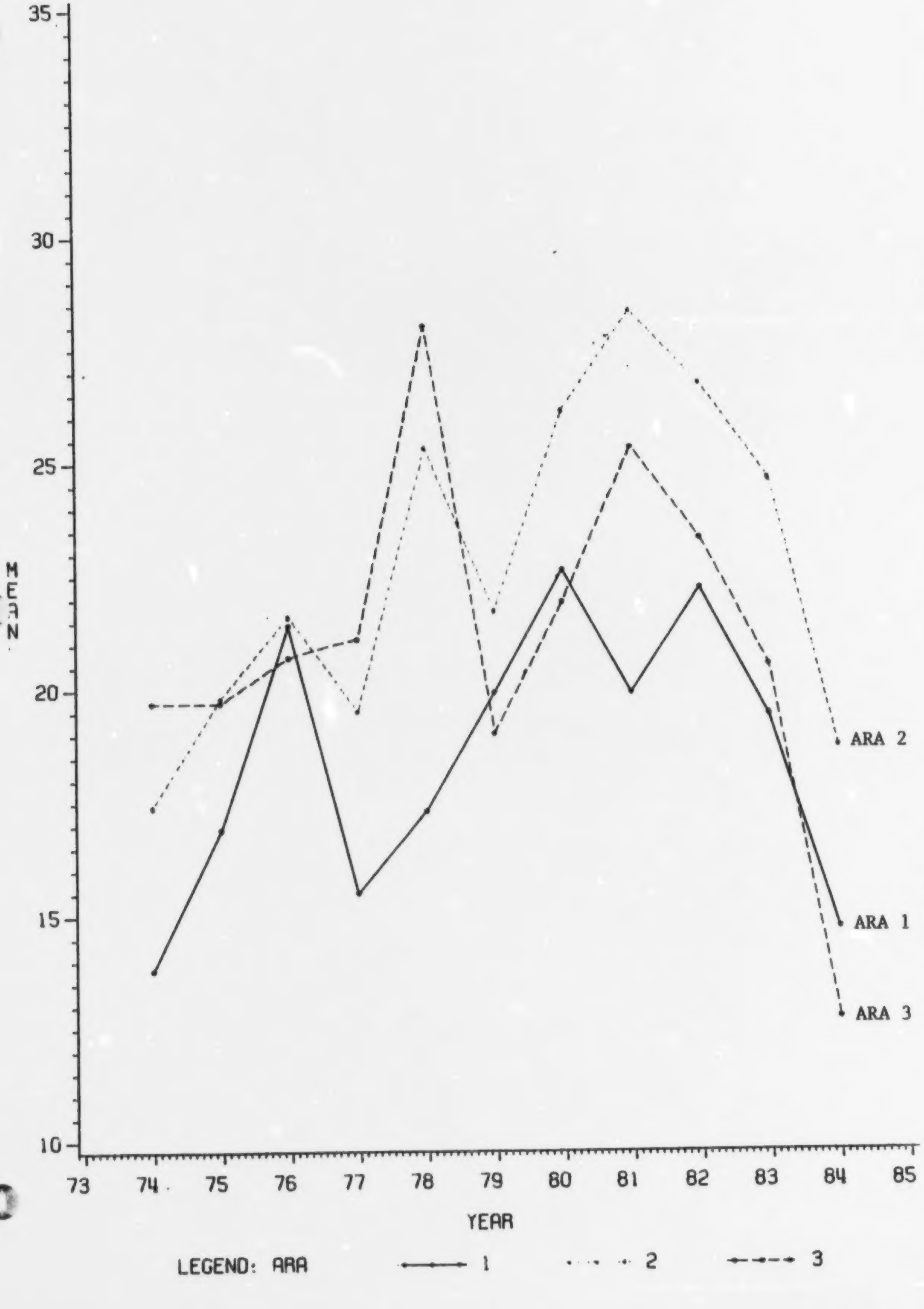
C.W.B. CROP YIELDS FOR BARLEY, PER ARA, 74–84



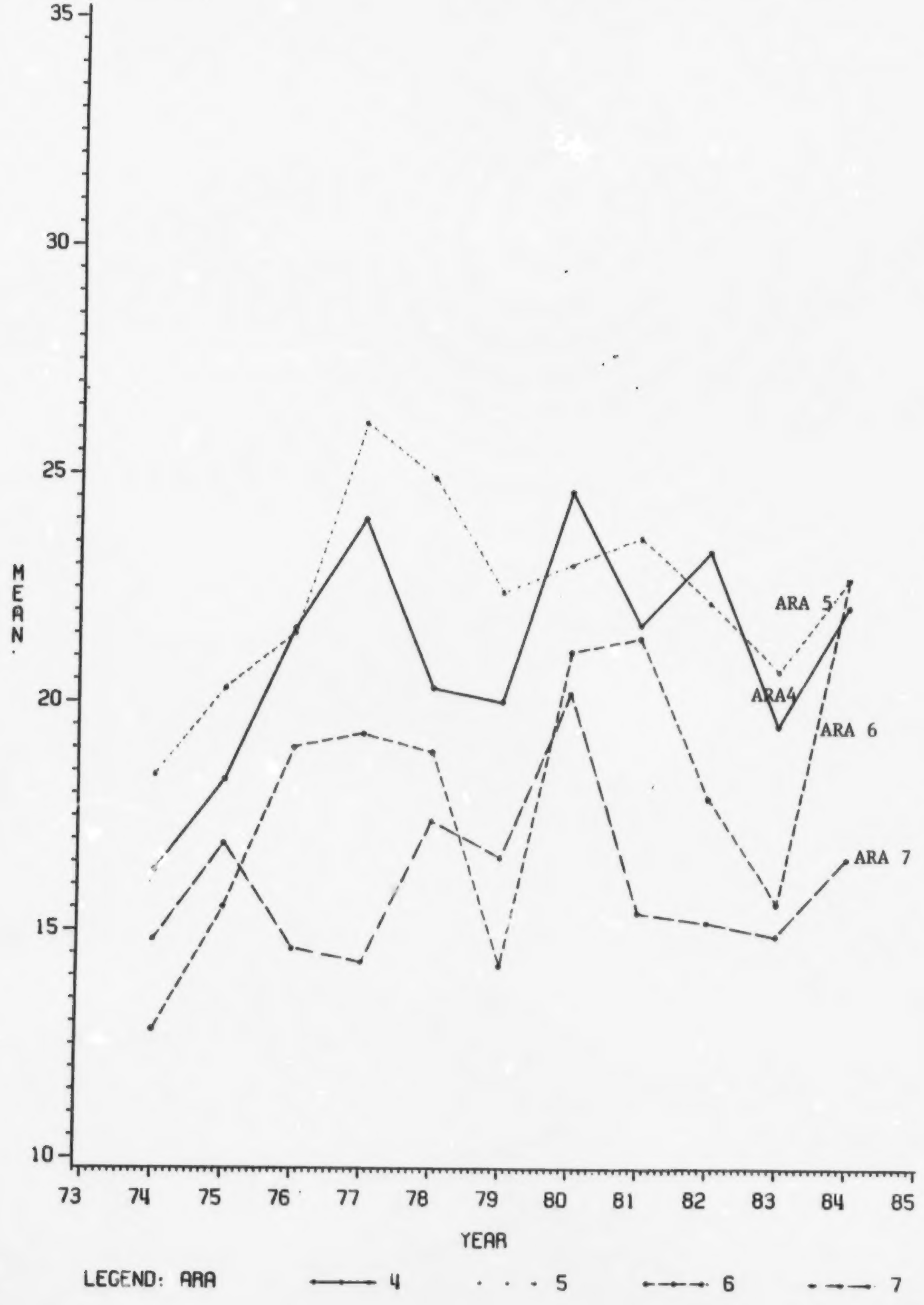
.W.B. CROP YIELDS FOR BARLEY, PER ARA, 74–84

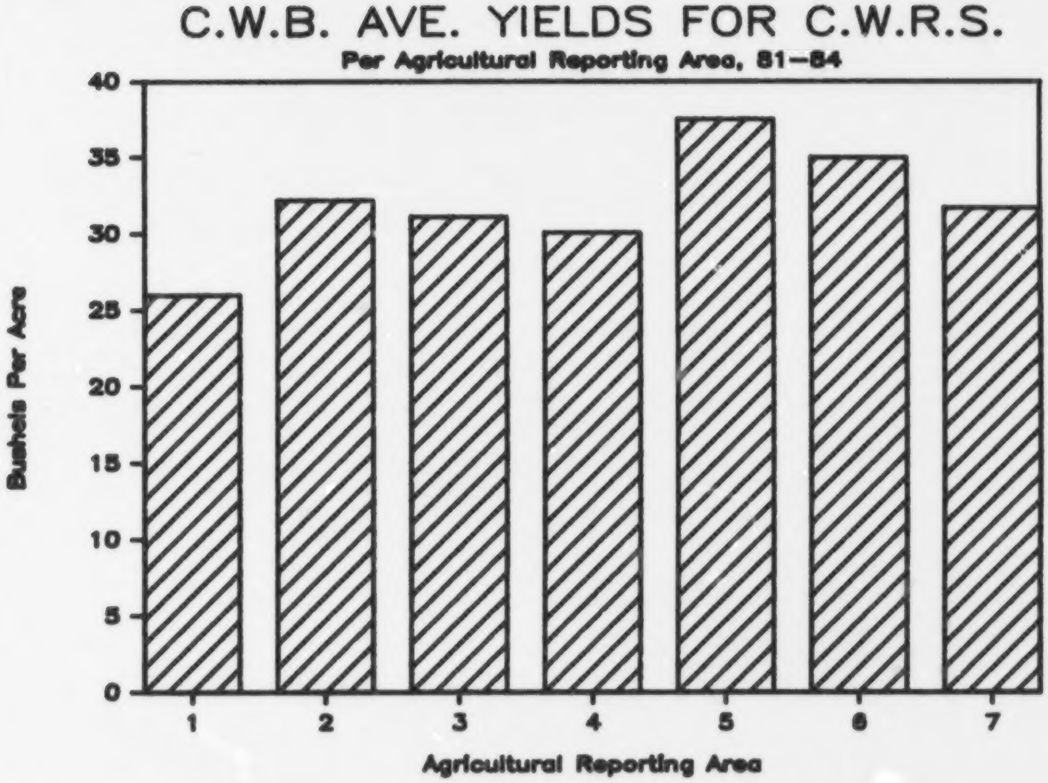


C.W.B. CROP YIELDS FOR CANOLA PER ARA, 74–84



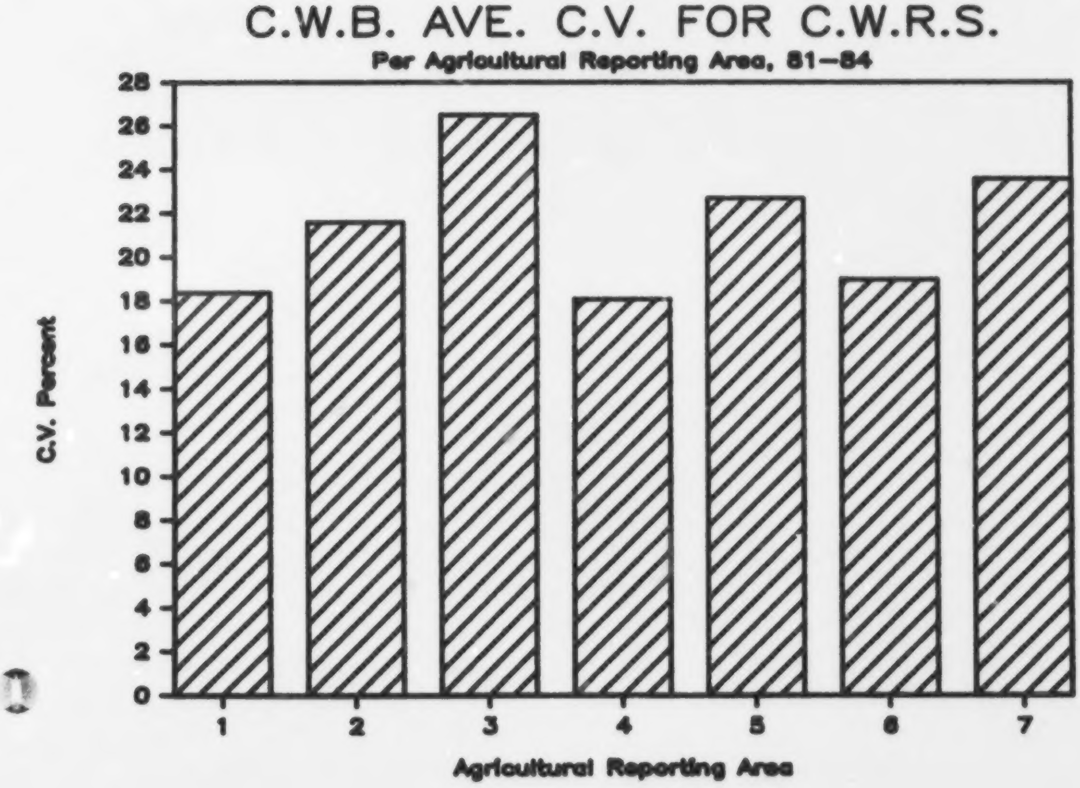
C.W.B. CROP YIELDS FOR CANOLA PER ARA, 74–84





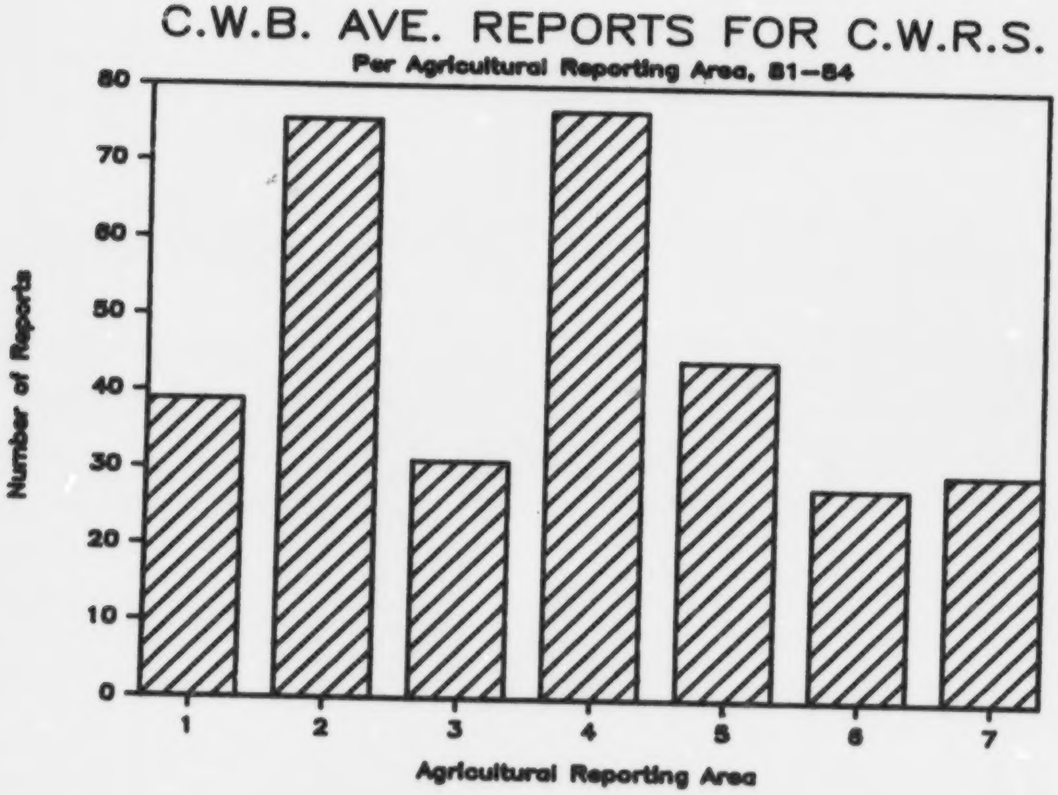
C.W.B. AVE. YIELDS FOR C.W.R.S.

Per Agricultural Reporting Area, 81–84



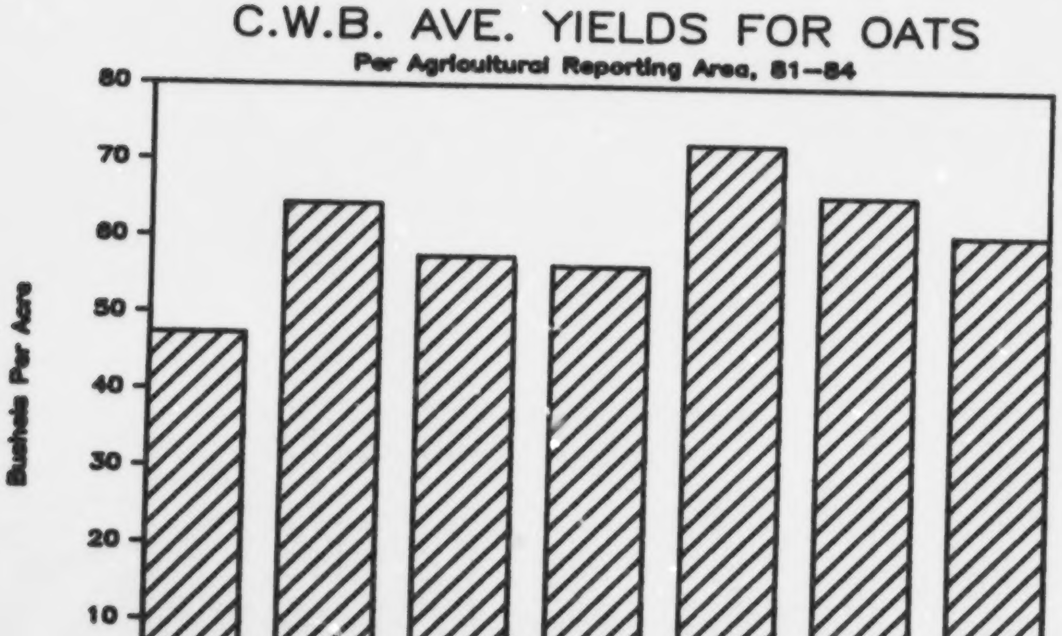
C.W.B. AVE. C.V. FOR C.W.R.S.

Per Agricultural Reporting Area, 81–84



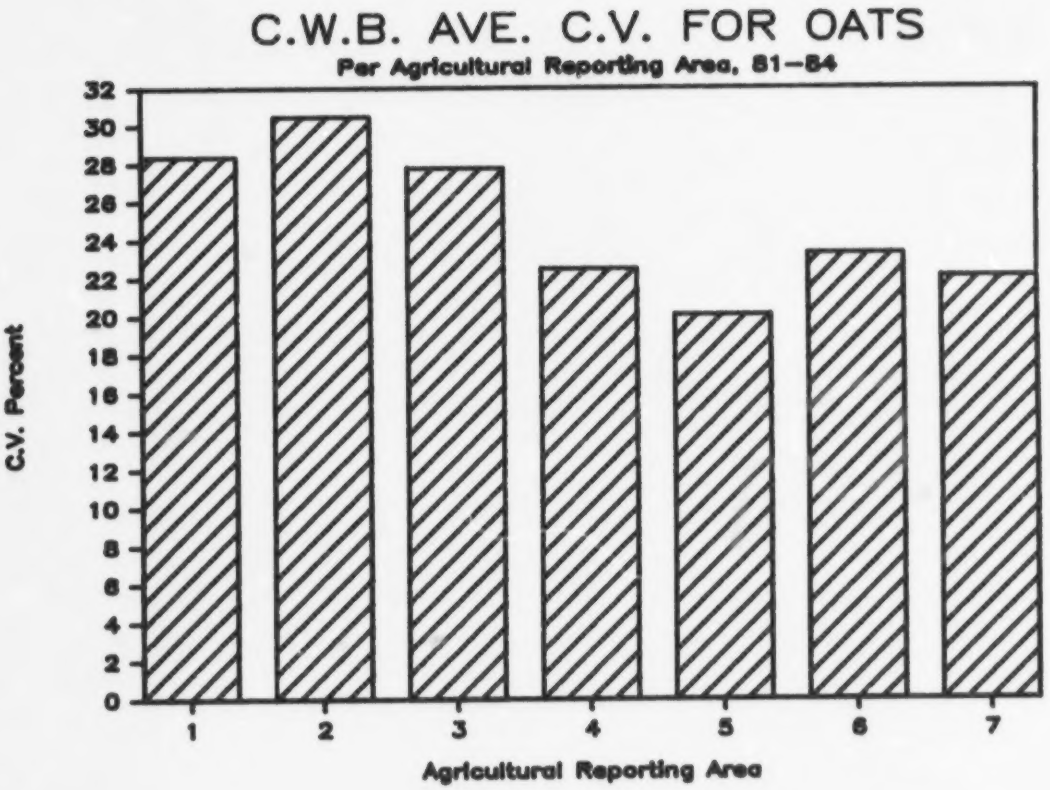
C.W.B. AVE. REPORTS FOR C.W.R.S.

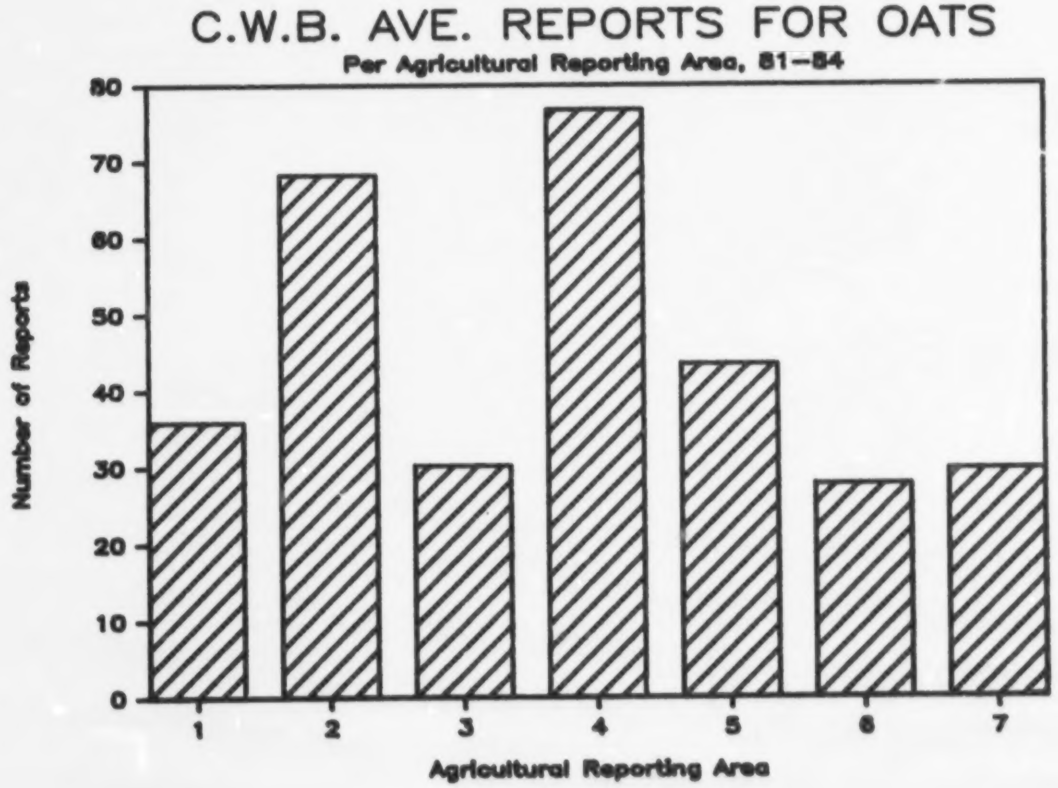
Per Agricultural Reporting Area, 81–84

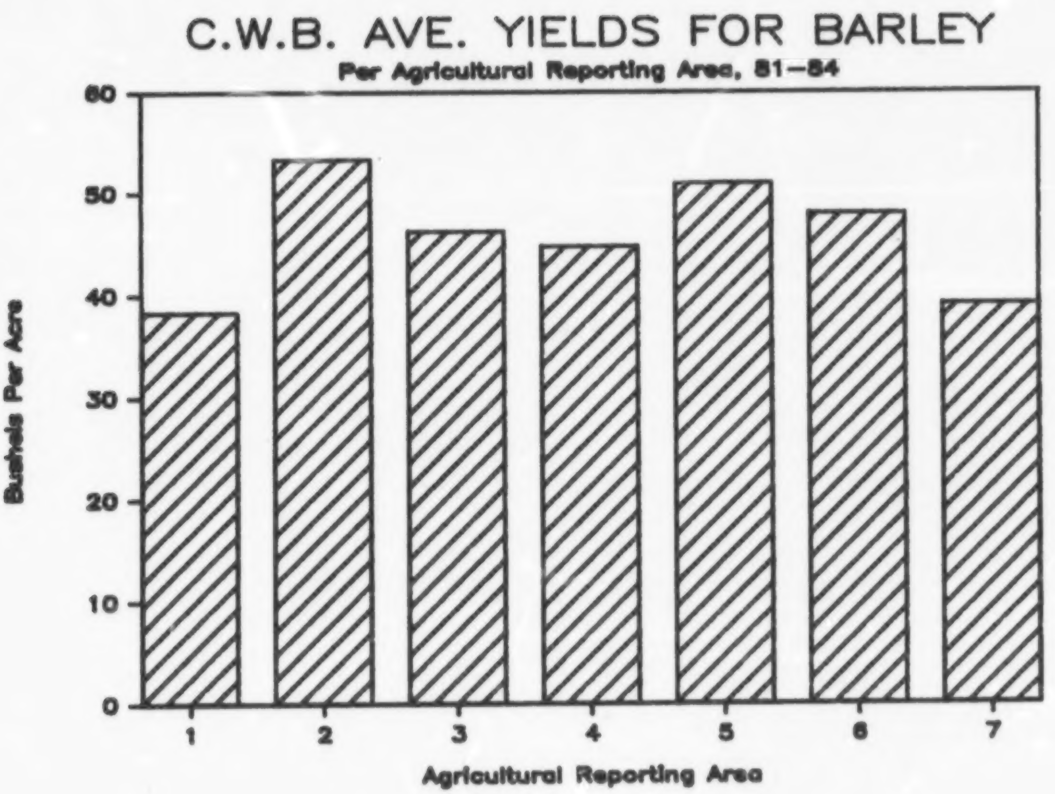


C.W.B. AVE. YIELDS FOR OATS

Per Agricultural Reporting Area, 81–84

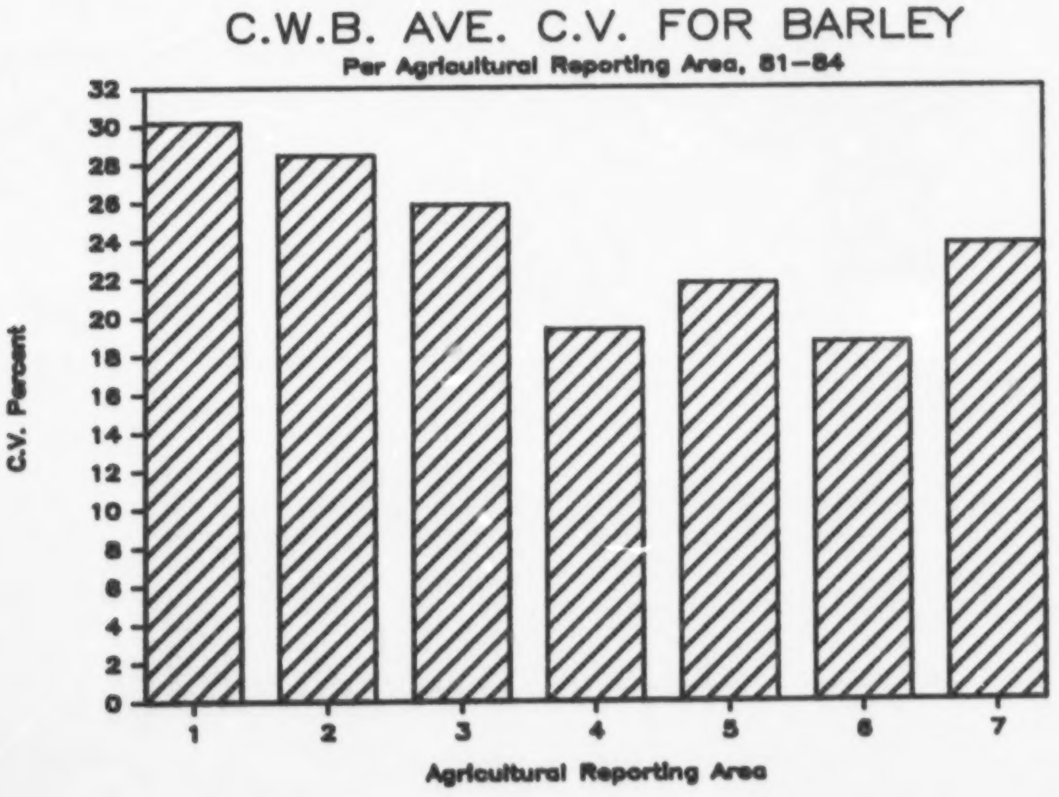

C.W.B. AVE. C.V. FOR OATS
Per Agricultural Reporting Area, 81-84
C.V. Percent
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
7
Agricultural Reporting Area


C.W.B. AVE. REPORTS FOR OATS
Per Agricultural Reporting Area, 81-84
Number of Reports
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
Agricultural Reporting Area



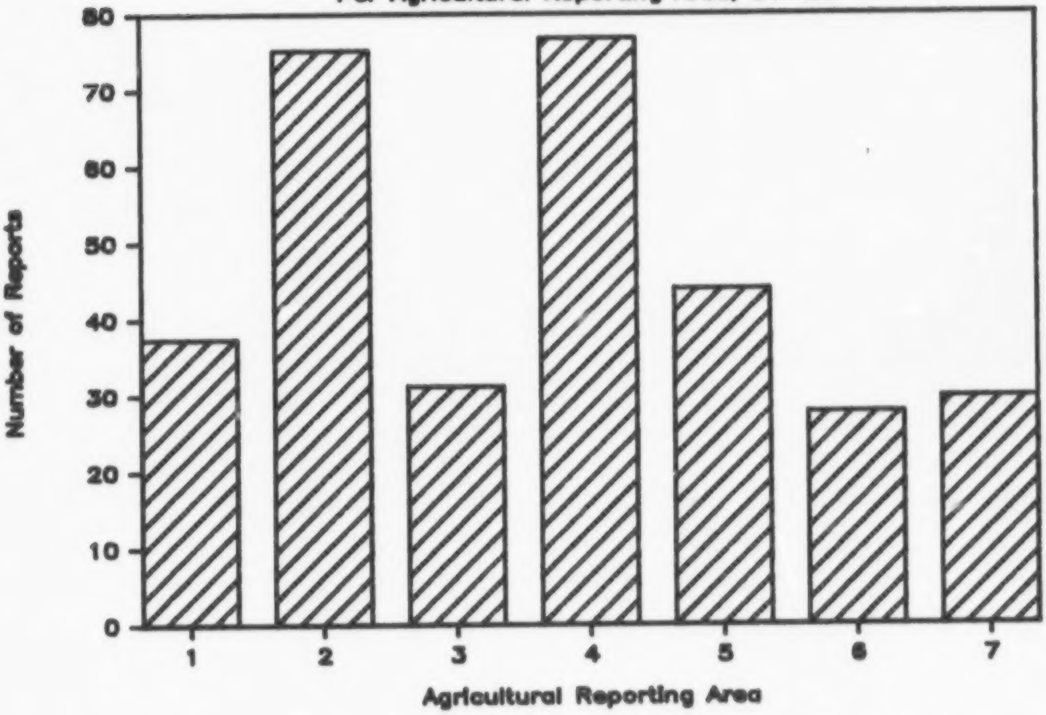
C.W.B. AVE. YIELDS FOR BARLEY

Per Agricultural Reporting Area, 81–84



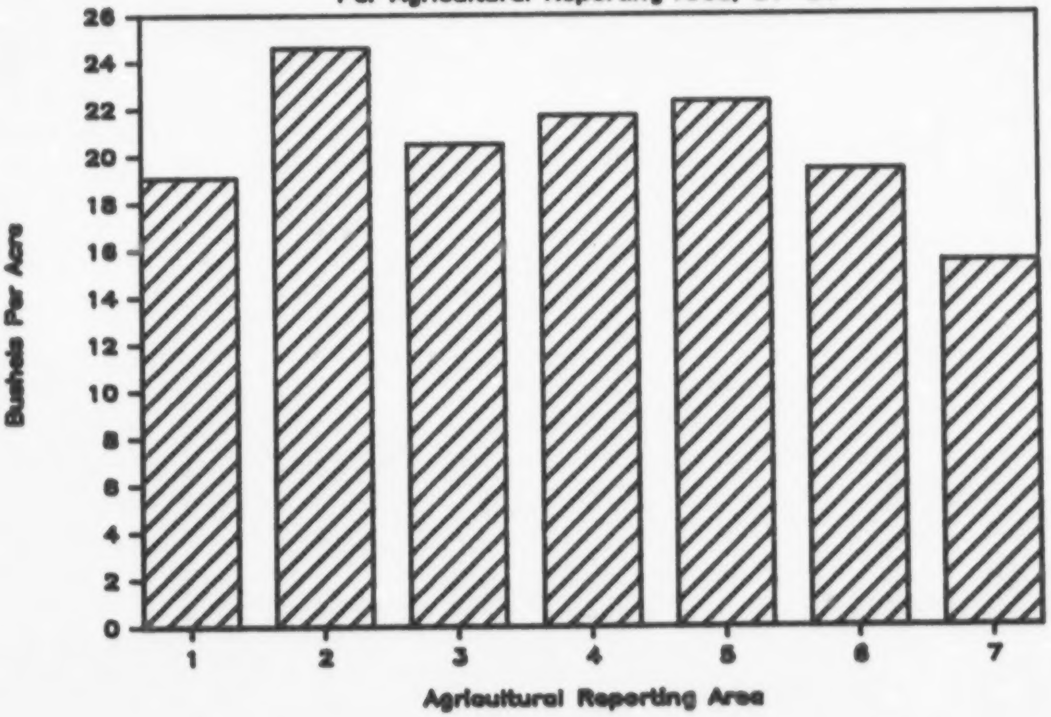
C.W.B. AVE. C.V. FOR BARLEY

Per Agricultural Reporting Area, 81–84



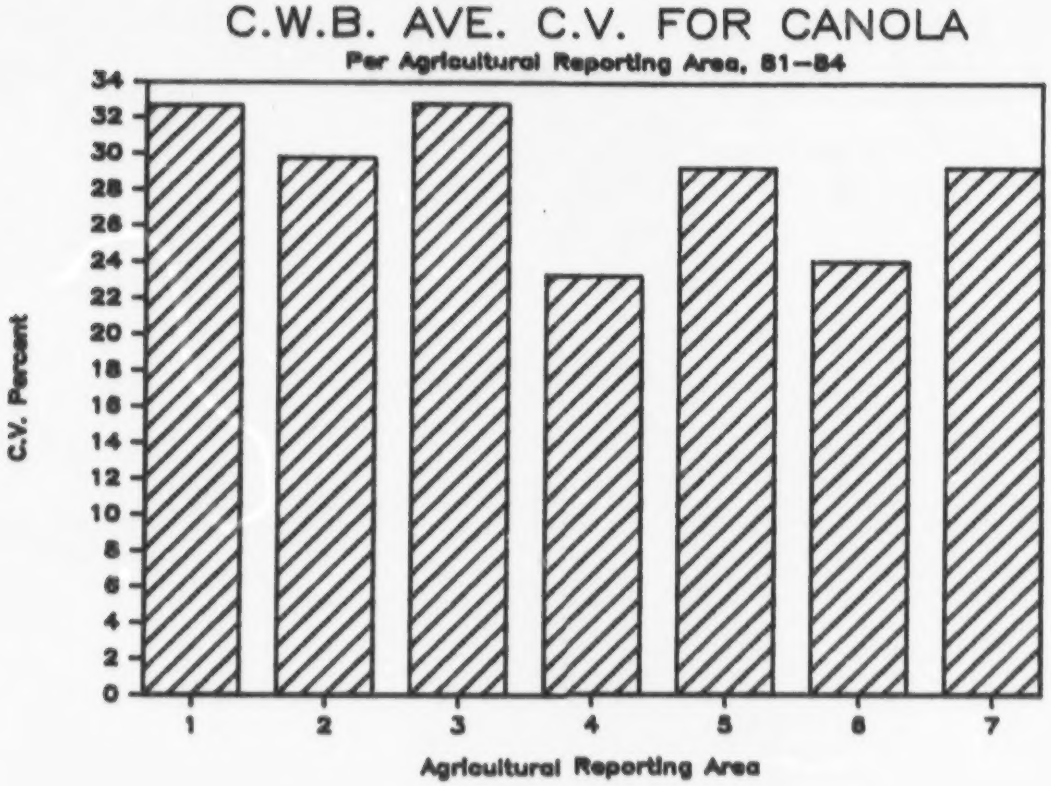
C.W.B. AVE. REPORTS FOR BARLEY

Per Agricultural Reporting Area, 81–84



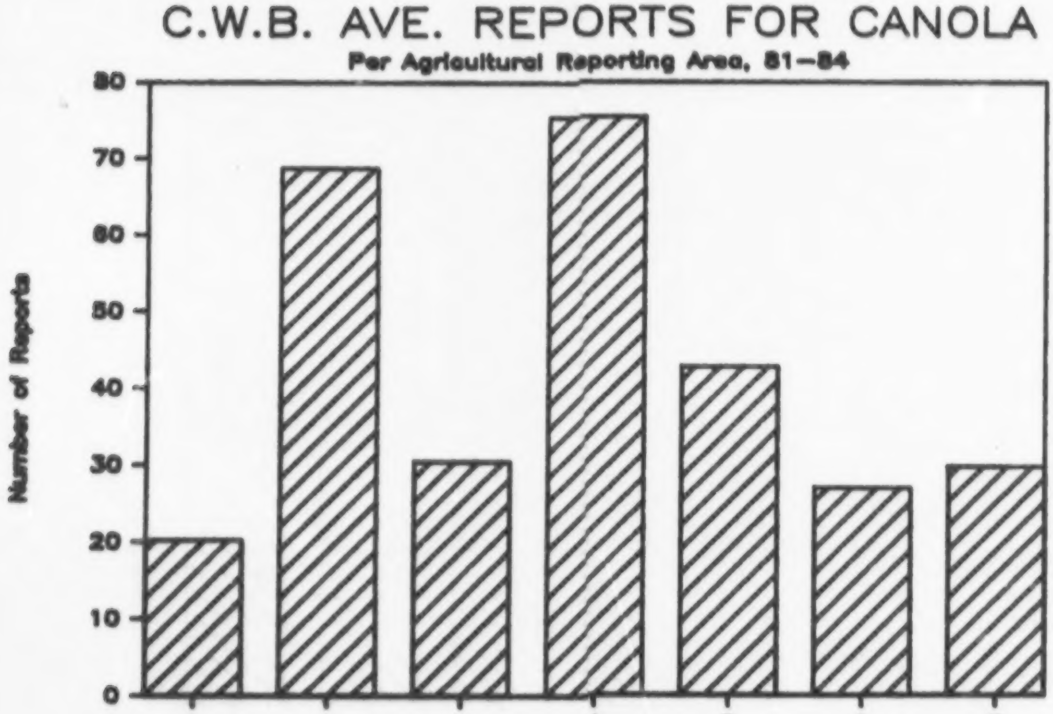
C.W.B. AVE. YIELDS FOR CANOLA

Per Agricultural Reporting Area, 81–84



C.W.B. AVE. C.V. FOR CANOLA

Per Agricultural Reporting Area, 81–84



C.W.B. AVE. REPORTS FOR CANOLA

Per Agricultural Reporting Area, 81–84

III. Yield Estimates for Major Crops in Alberta, Based on Alberta Agriculture Data, 1981 - 1984

Section III Outline

The data used in Section III is based on Alberta Agriculture Crop Report questionnaires completed by producers and district agriculturists in the autumns of 1981 to 1984. This section is divided into two subsections. Subsection IIIA provides annual yield estimates by Region for the major crops grown in Alberta. The 4-year average yield, CV and number of reports are also provided.

Subsection IIIB follows the same format as Subsection IIIA but results are provided at the Agricultural Reporting Area (ARA) level.

A. i) Yield Estimates by Region, 1981 - 1984

ii) 4-Year Average of Yield, CV and Number of Reports, by Region, 1981 - 1984

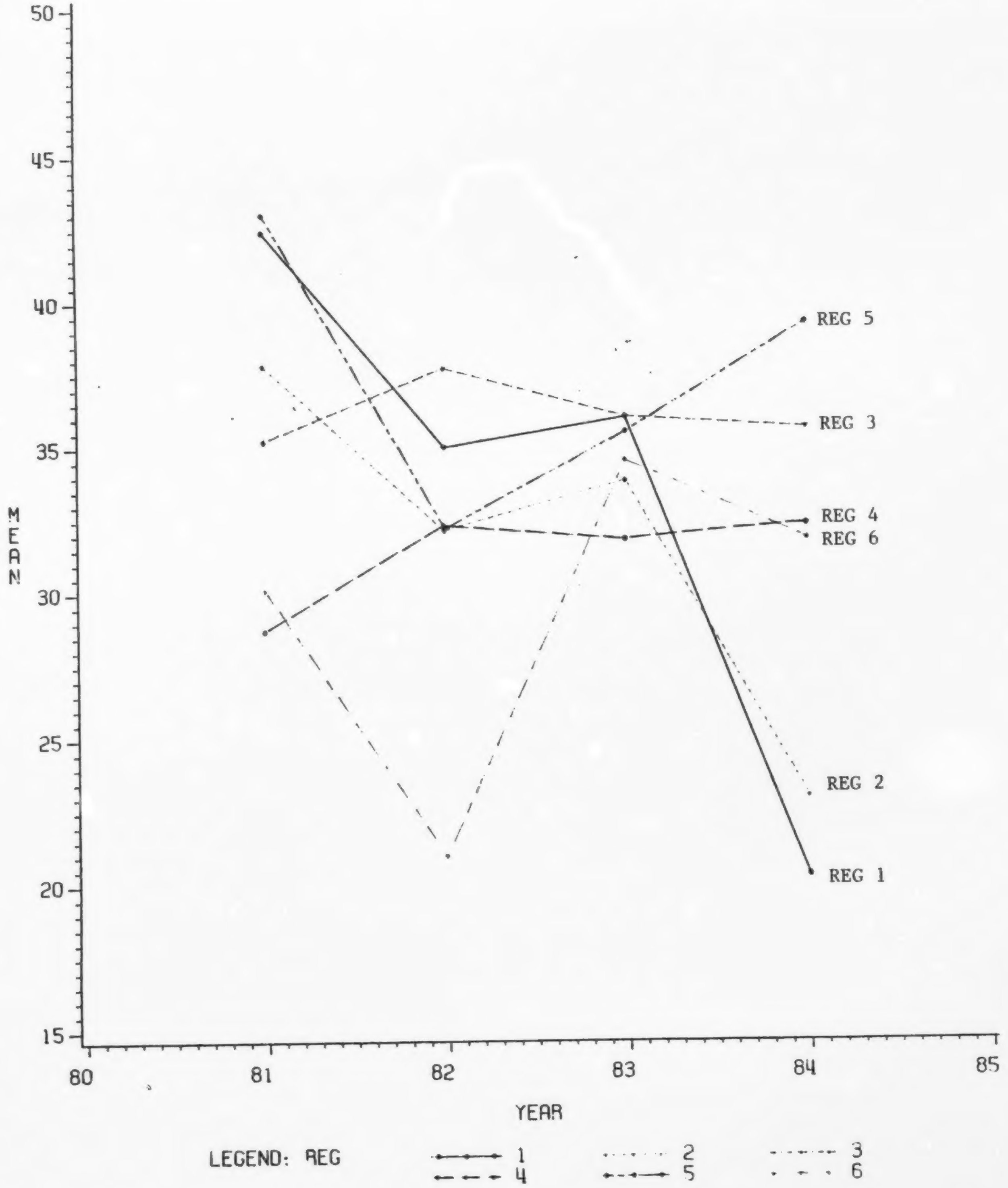
Subsection IIIA Highlights

In 1984, yield declines were indicated for wheat, oats and barley in Regions 1, 2, 3, and 6. Most pronounced were the declines in Regions 1 and 2 due to recent dry conditions. Canola yields declined sharply in Regions 1 and 2 as well. The balance of the Regions showed yield increases in 1984. The 4-year average yields for wheat in all 6 Regions are quite similar, varying from a low of just under 30 bushels in Region 6 to 37 bushels in Region 5. Oats and barley yields are also highest in Region 5, 72 and 54 bushels, respectively. Region 1 was the lowest yielding for both crops, with 51 and 36 bushels per acre for oats and barley, respectively. Canola yields varied between 22 and 24 bushels per acre for Regions 1 through 5. Region 6 was considerably lower with average yield of just over 16 bushels per acre.

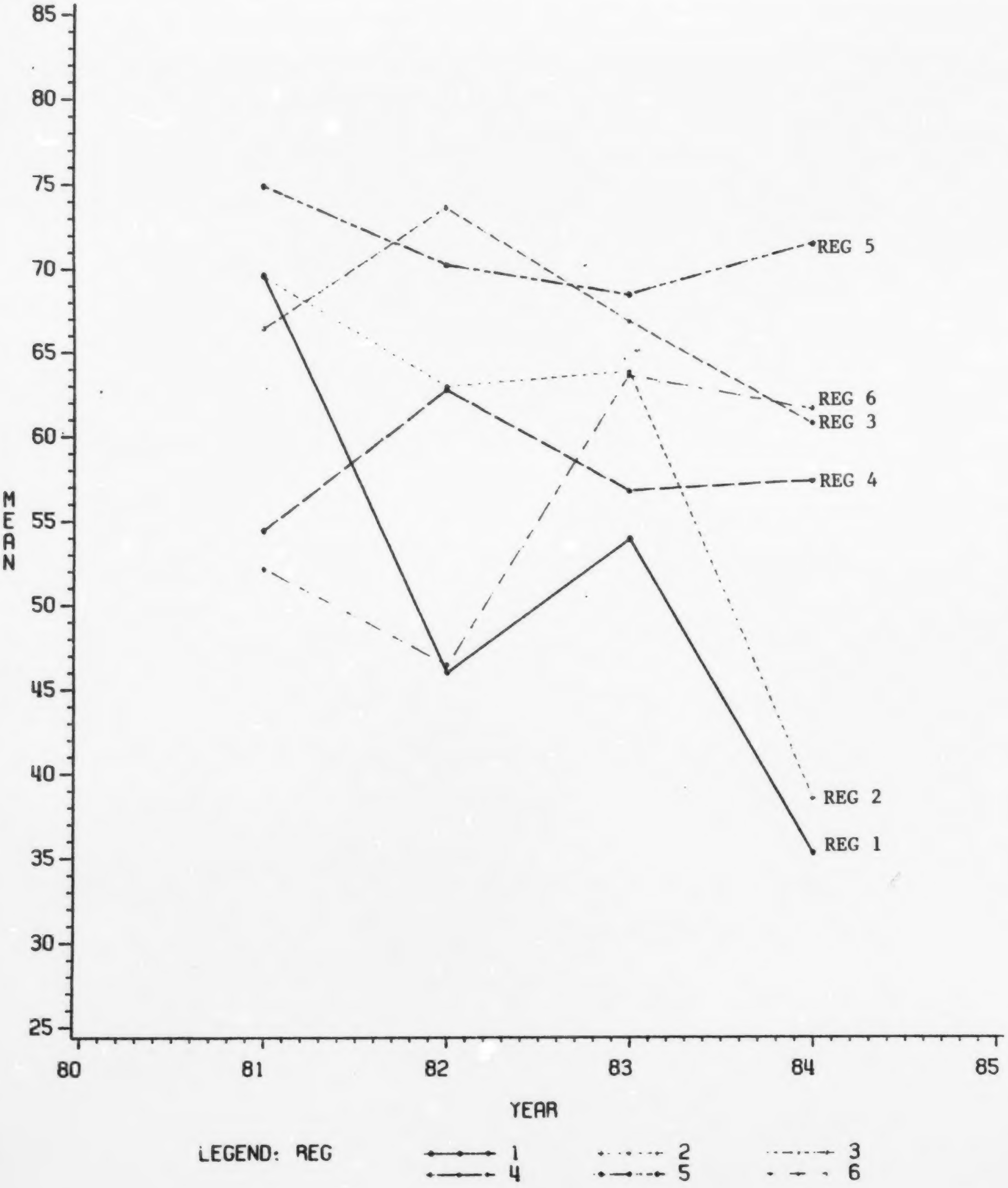
High CVs were again expected because the Regions are so large and variable. Data for Region 1 was consistently the most questionable due to CVs of approximately 40% for all 4 crops examined. Region 1 is composed of several soil types and contains both irrigated and dry land. These two factors likely contribute greatly to the yield variability within the Region.

In many cases, however, the CVs are low and the data can be considered quite reliable. The average number of reports per Region and crop was generally about 20.

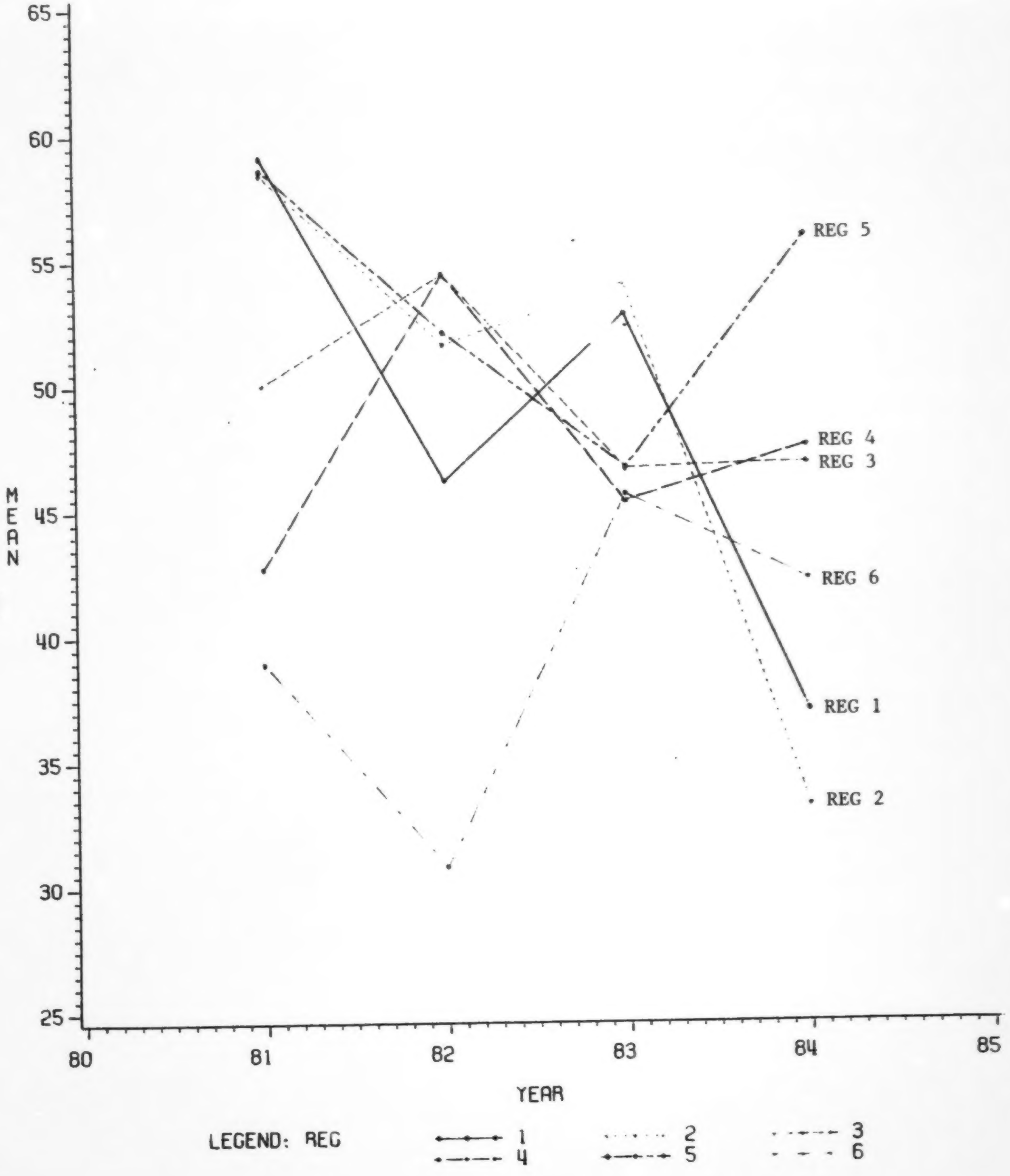
AVERAGE YIELDS FOR WHEAT, PER REGION, 81–84 ALTA AG.



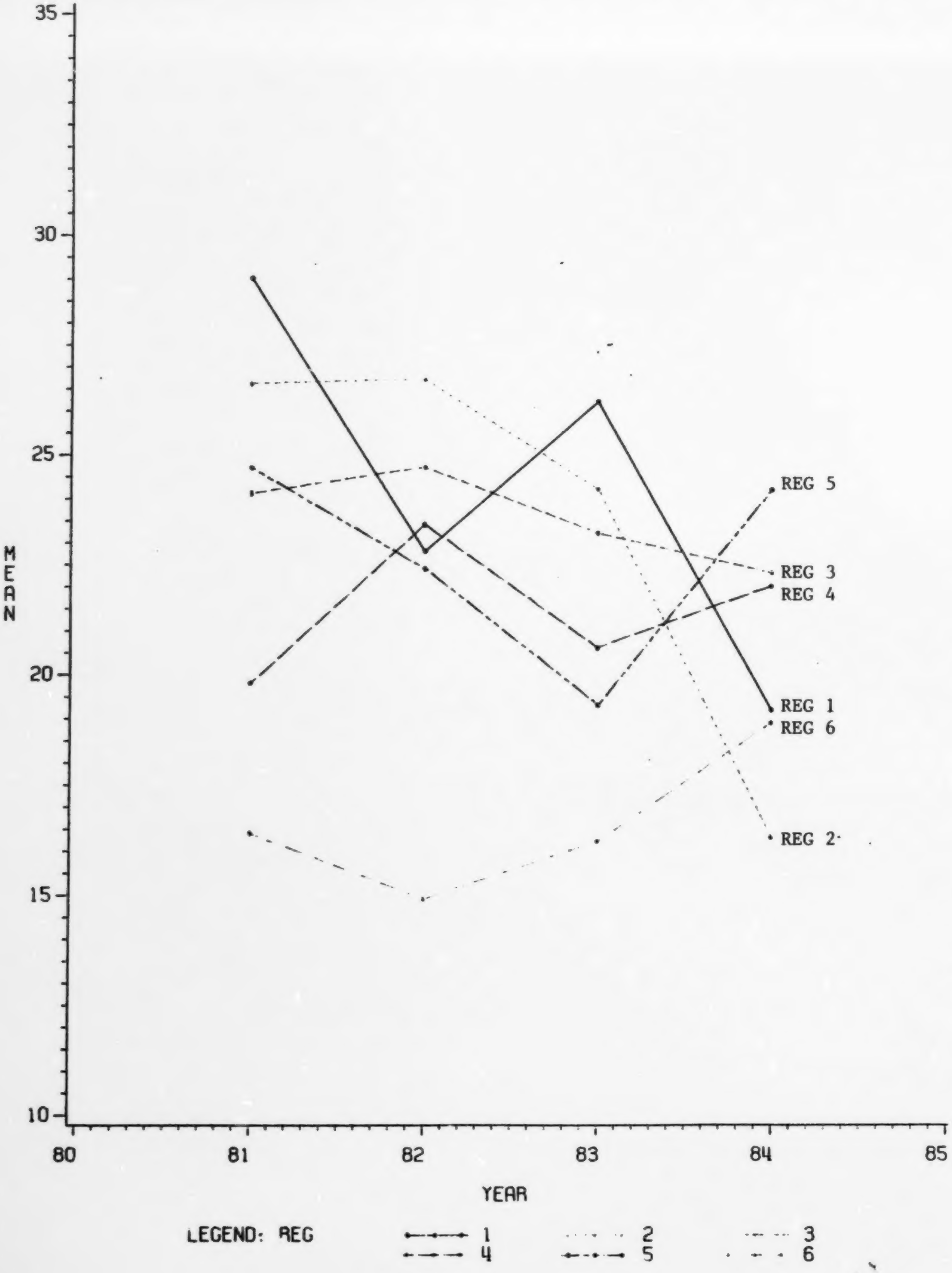
AVERAGE YIELDS FOR OATS, PER REGION, 81–84 ALTA. AG.

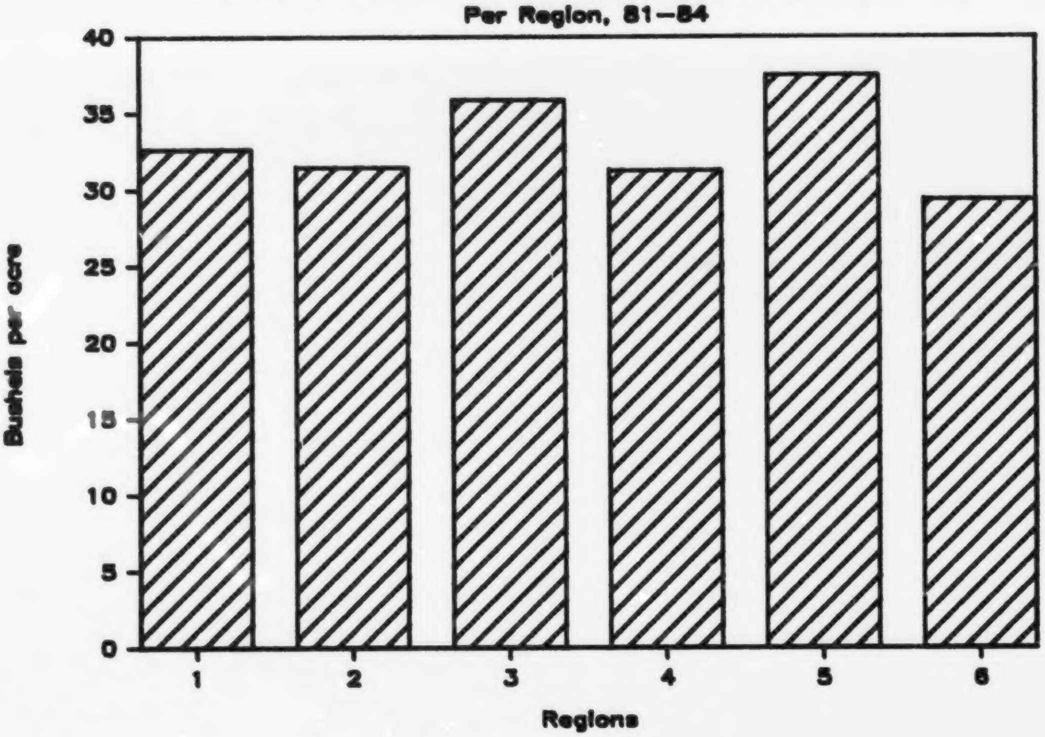


AVERAGE YIELDS FOR BARLEY, PER REGION, 81-84 ALTA. AG.



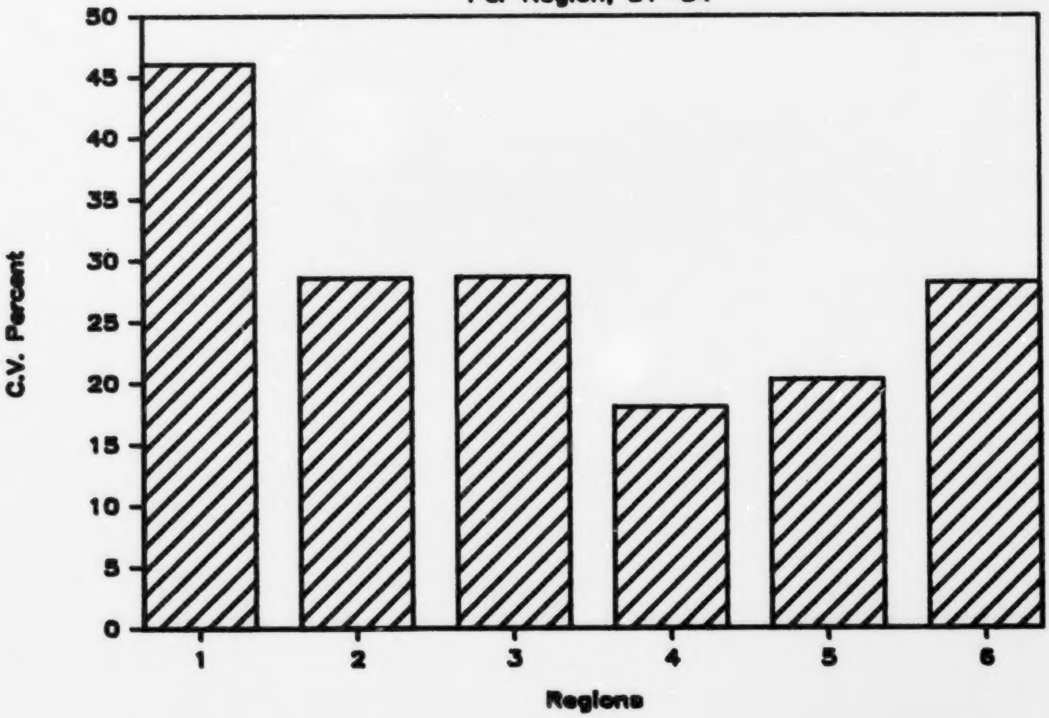
AVERAGE YIELDS FOR CANOLA, PER REGION, 81–84 ALTA.AG.





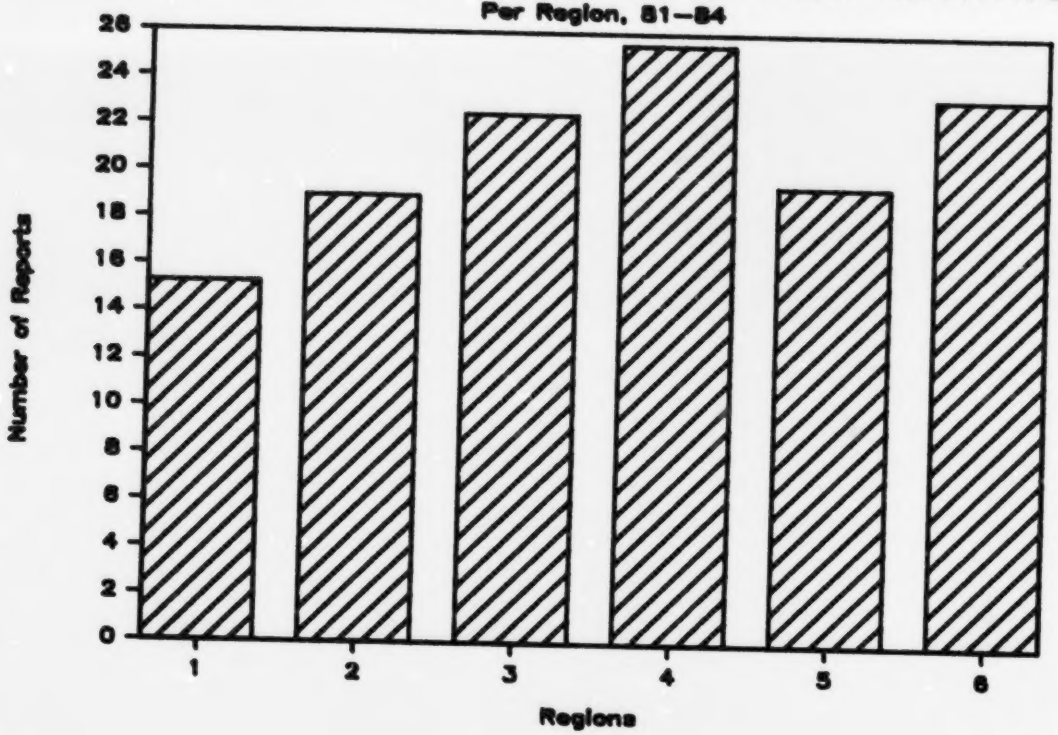
ALTA. AG. YIELDS FOR C.W.R.S.

Per Region, 81–84



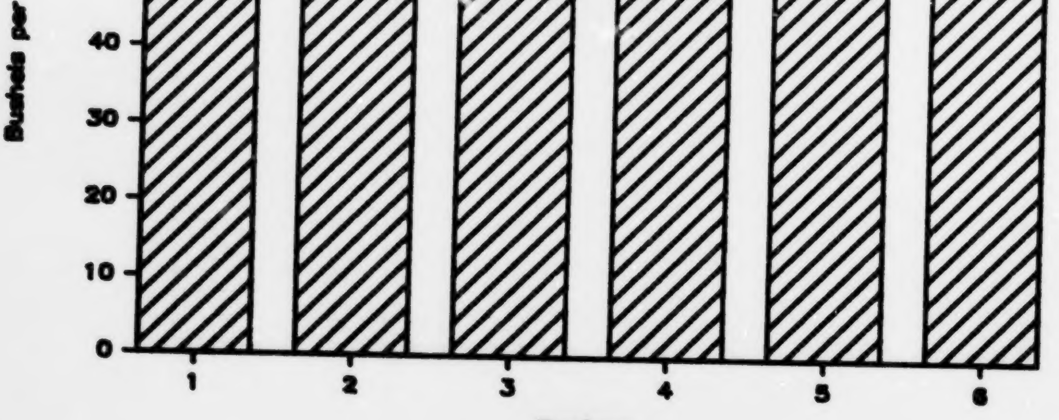
ALTA. AG. AVE. C.V. FOR C.W.R.S.

Per Region, 81–84



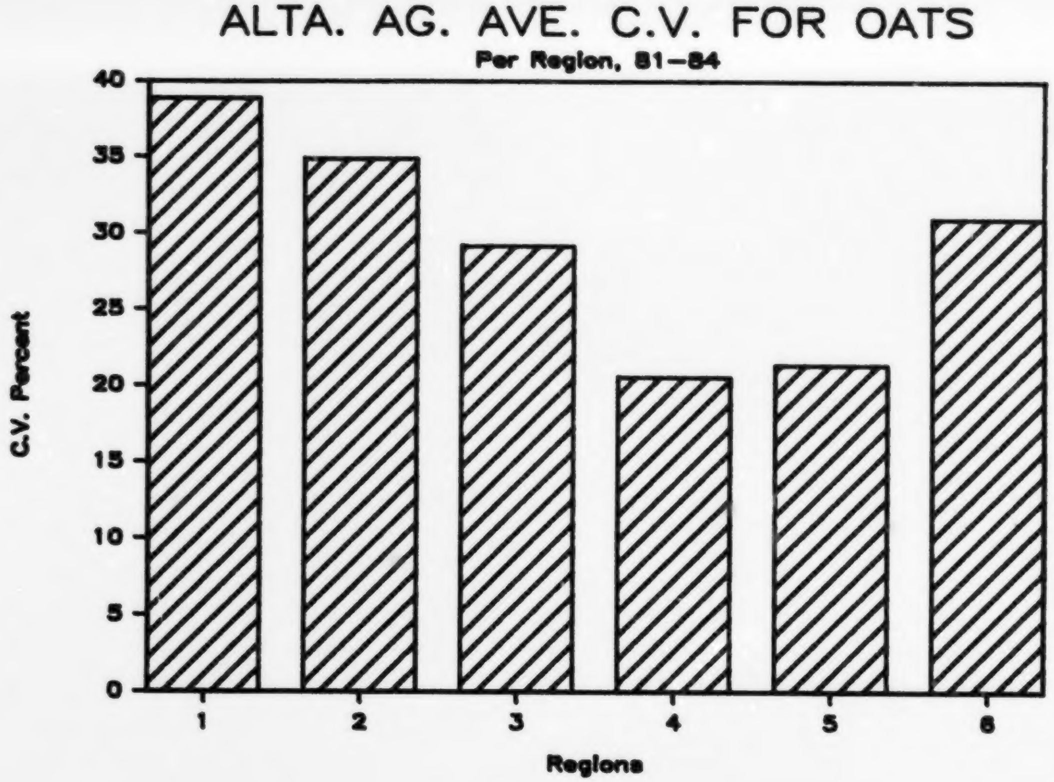
ALTA. AG. AVE. REPORTS FOR C.W.R.S.

Per Region, 81–84



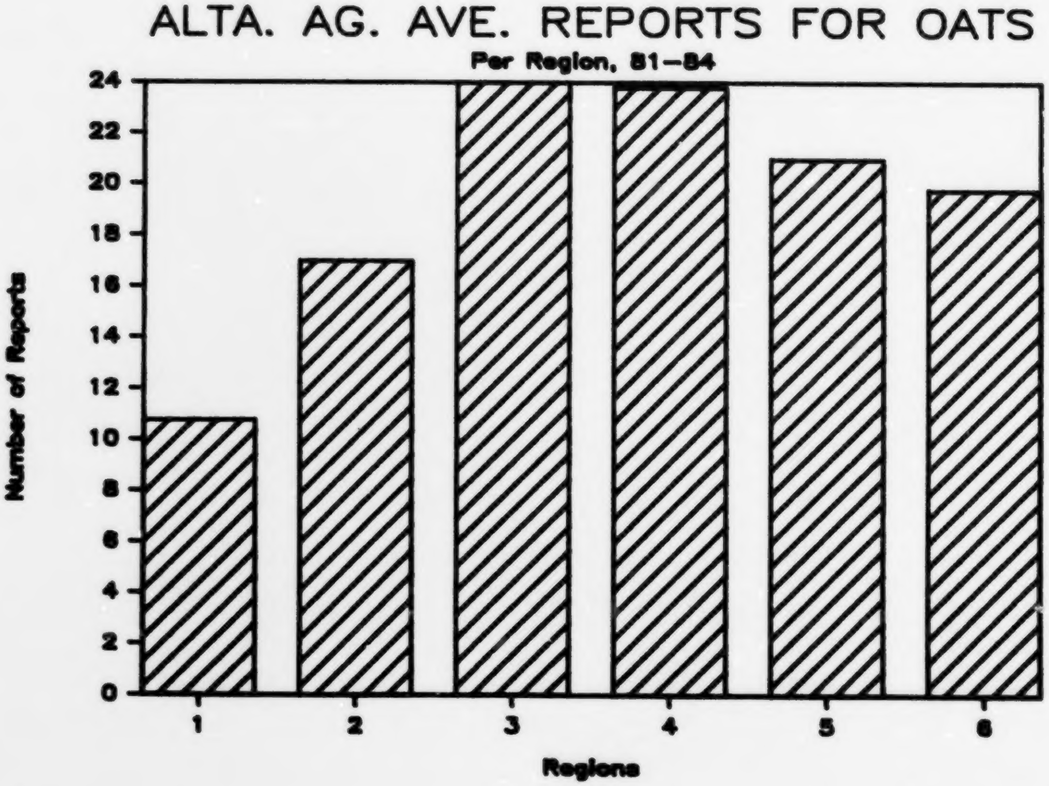
ALTA. AG. YIELDS FOR OATS

Per Region, 81–84



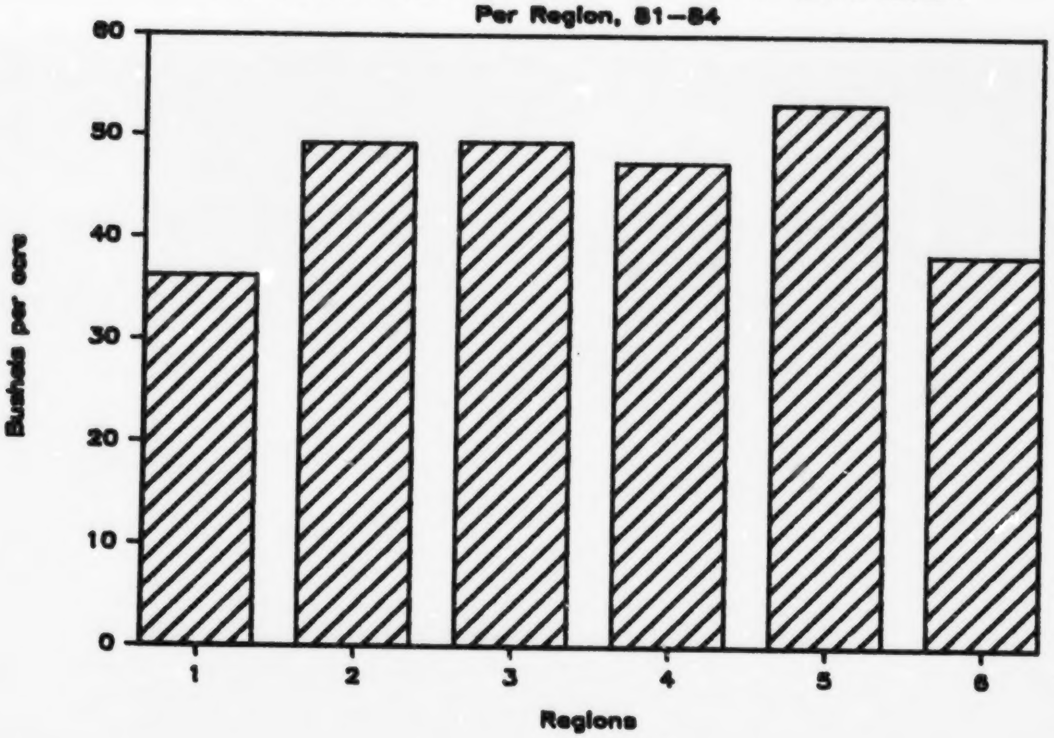
ALTA. AG. AVE. C.V. FOR OATS

Per Region, 81–84



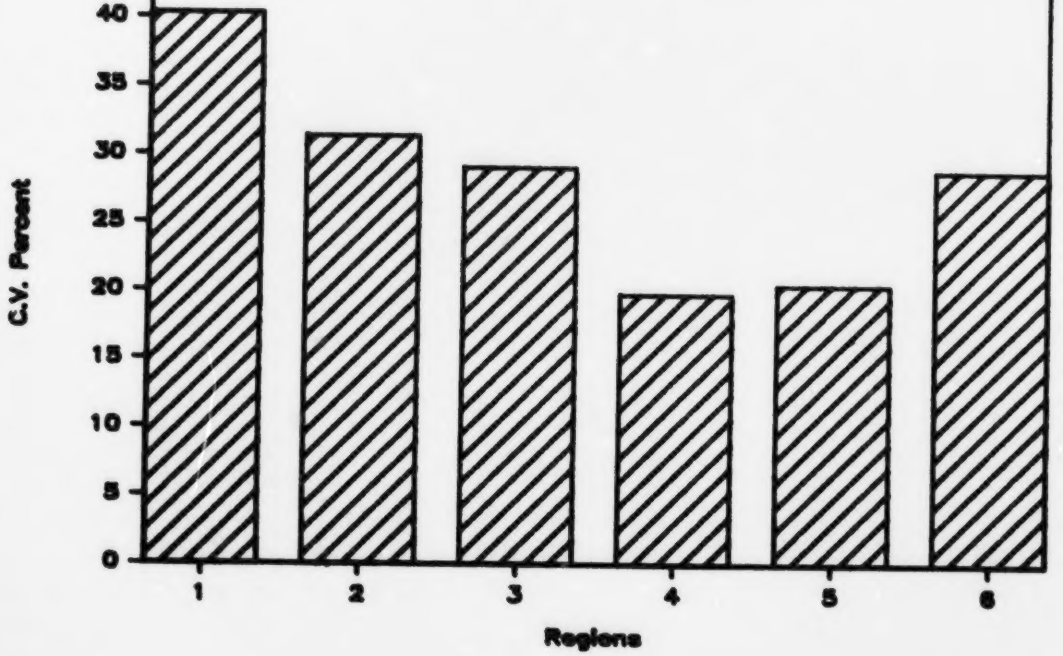
ALTA. AG. AVE. REPORTS FOR OATS

Per Region, 81–84



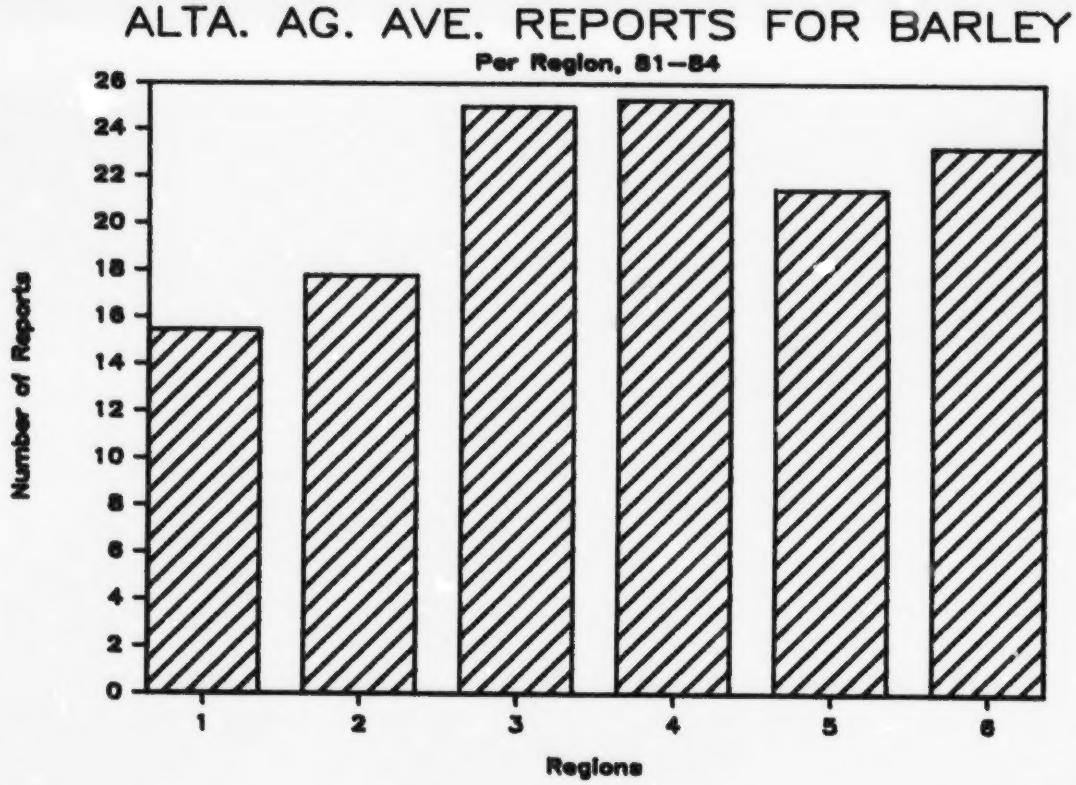
ALTA. AG. YIELDS FOR BARLEY

Per Region, 81–84



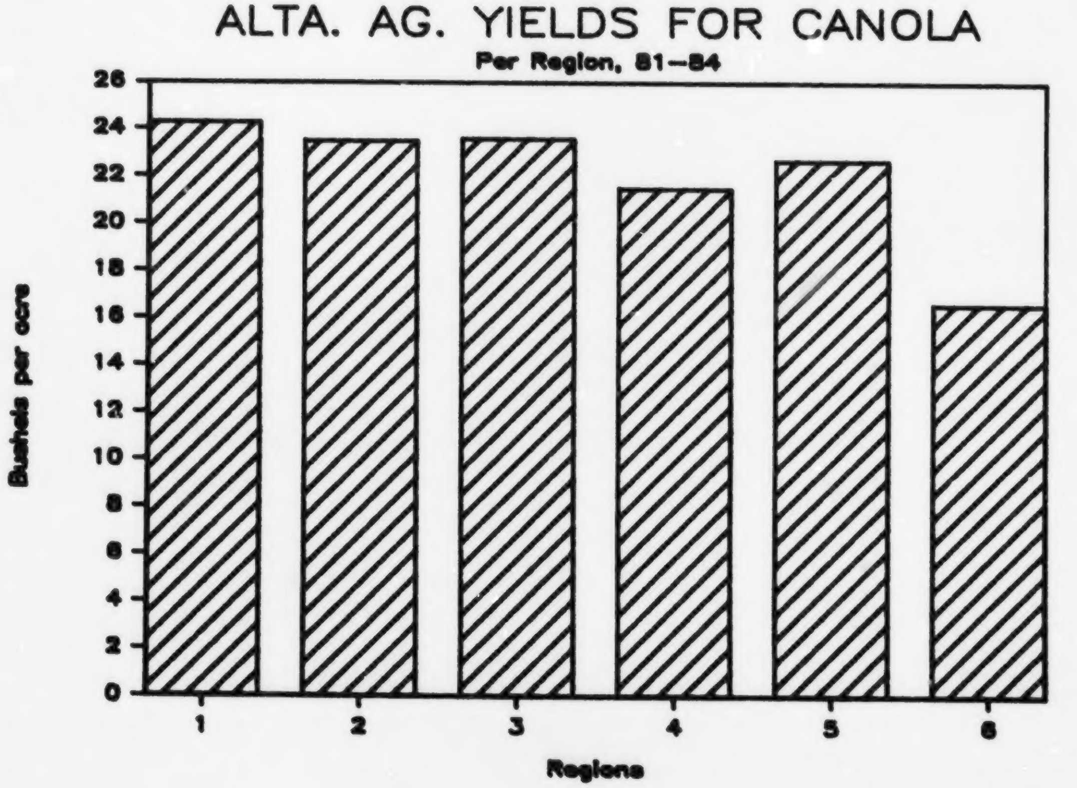
ALTA. AG. AVE. C.V. FOR BARLEY

Per Region, 81–84



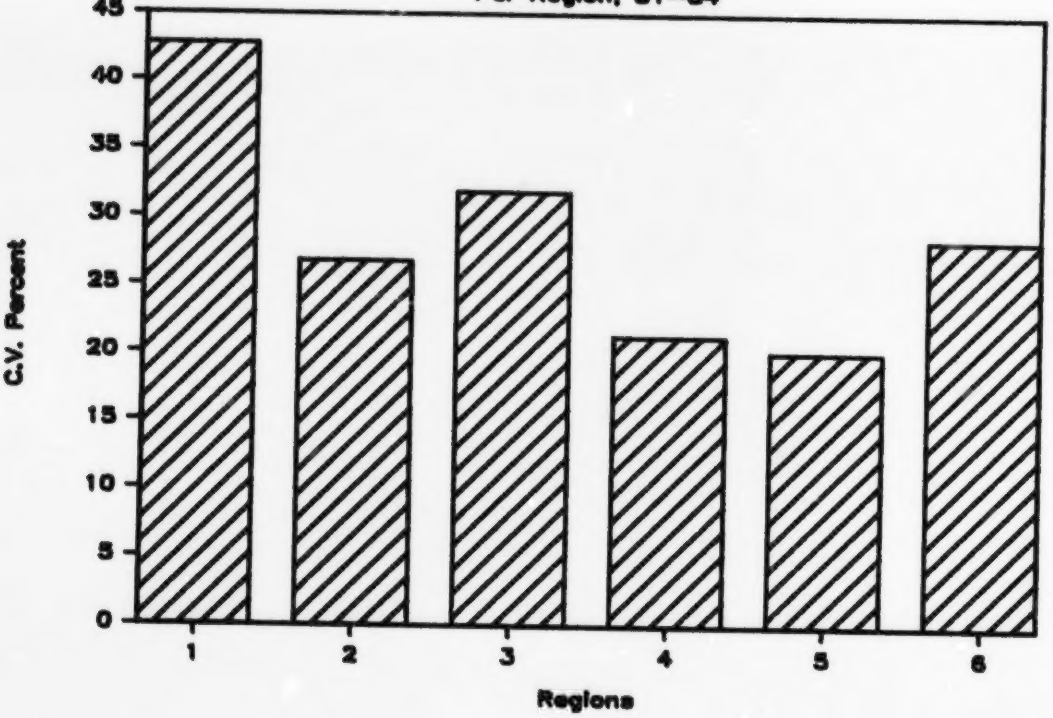
ALTA. AG. AVE. REPORTS FOR BARLEY

Per Region, 81–84



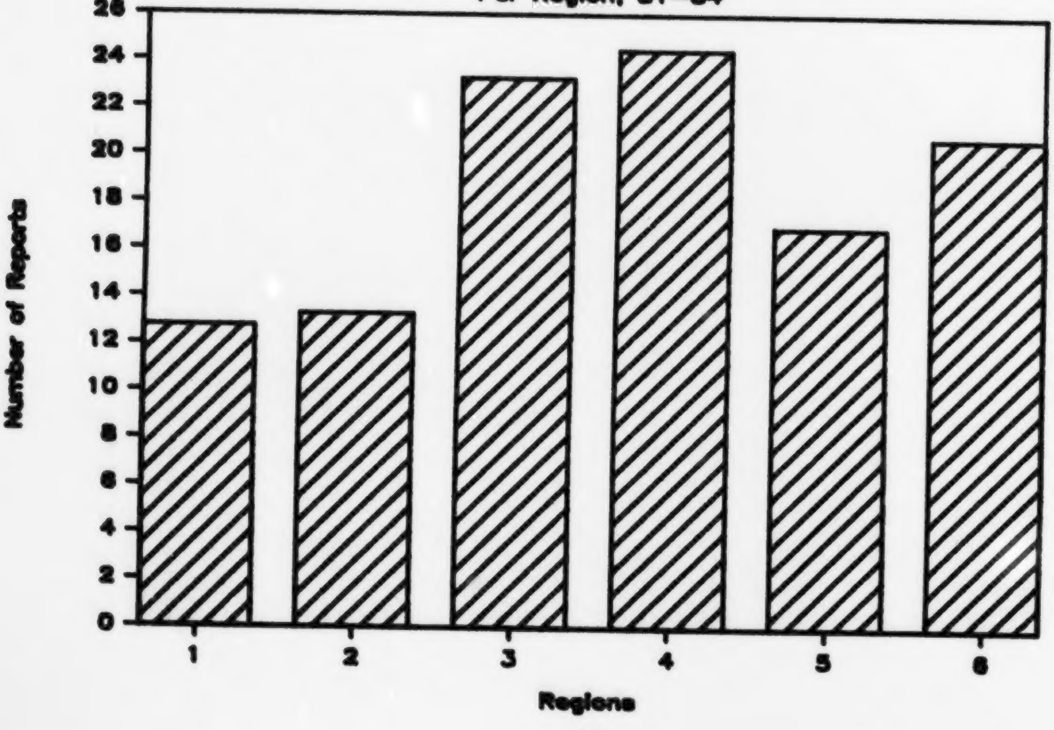
ALTA. AG. YIELDS FOR CANOLA

Per Region, 81–84



ALTA. AG. AVE. C.V. FOR CANOLA

Per Region, 81–84



ALTA. AG. AVE. REPORTS FOR CANOLA

Per Region, 81–84

B. i) Yield Estimates by Agricultural Reporting Area, 1981 - 1984

ii) 4-Year Average of Yield, CV and Number of Reports, by ARA, 1981 - 1984

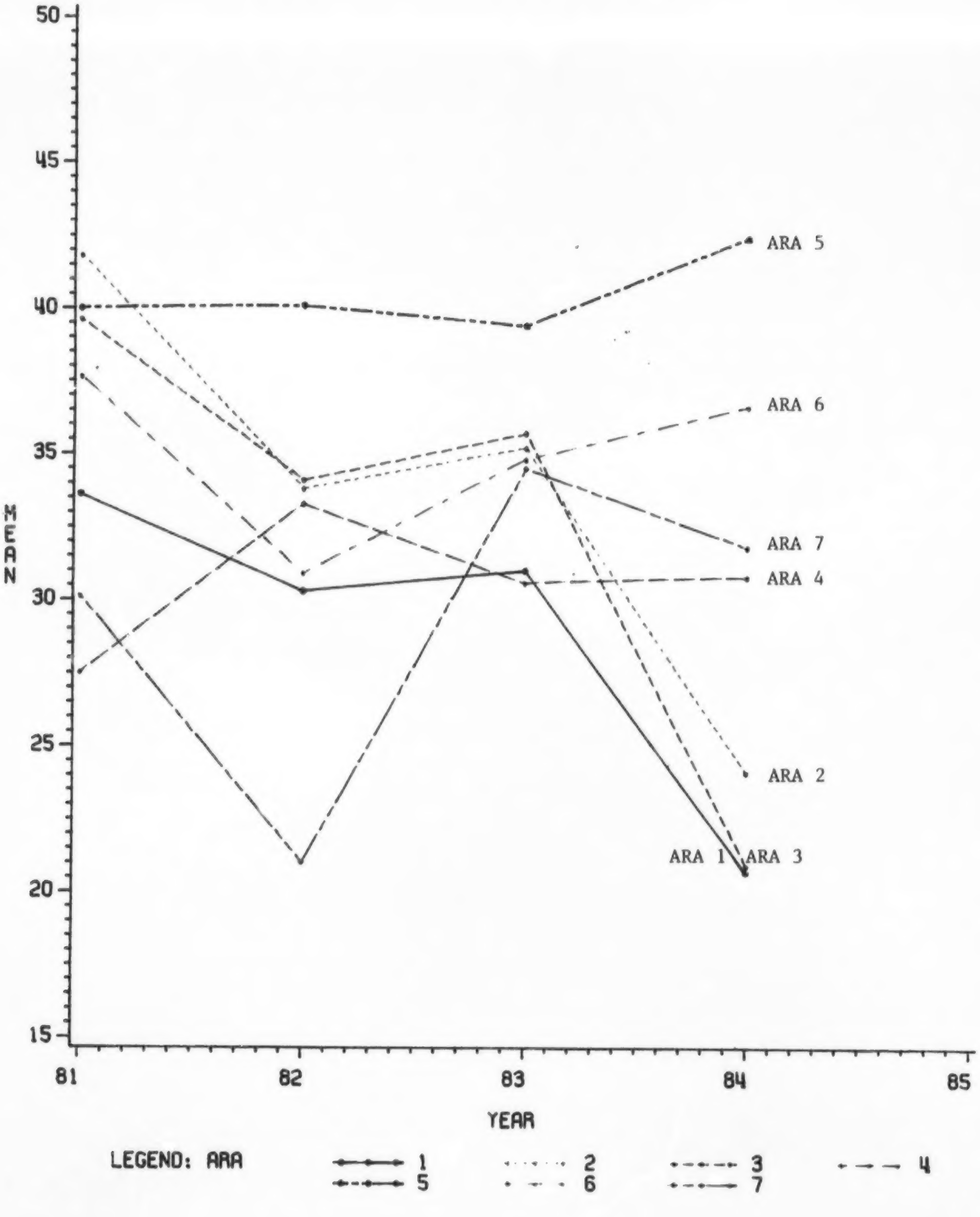
Subsection IIIB Highlights

The results of Subsection IIIB are based on the same data set used and discussed in Subsection IIIA. In this case, however, the data has been rearranged into Agricultural Reporting Areas (ARAs).

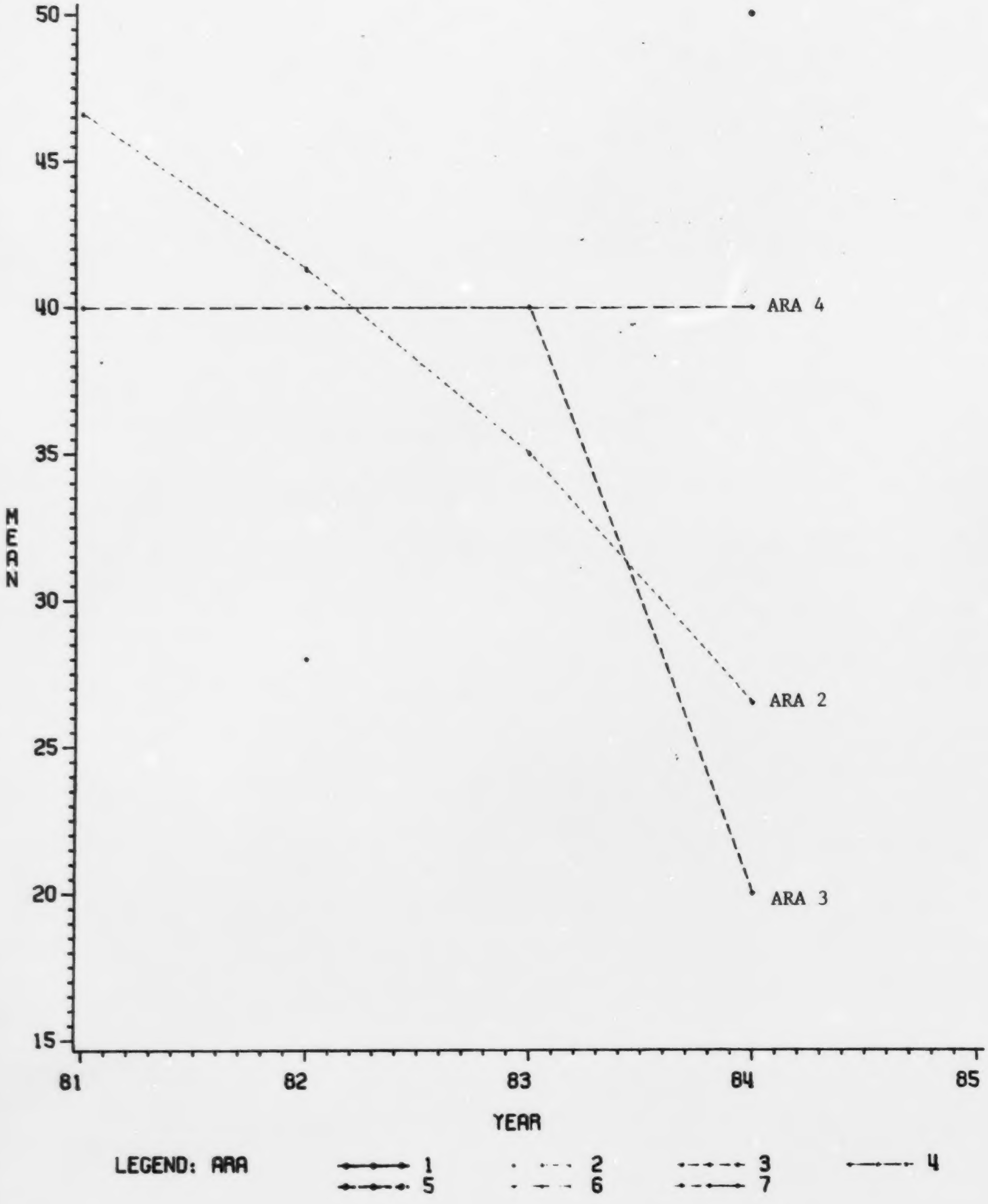
The general results are similar to those found in the ARA breakdowns using CWB data. The recent drought in southern Alberta again translates into Canada Western Red Spring and Soft White wheat yield decreases in southern districts in 1984. ARA 7 (essentially the Peace River Region) also showed a yield decline in 1984. Oats, barley, rye and canola show yield declines in 1984 as well.

The samples were generally quite small for the data used in Section III. As a result, means may be skewed by abnormally large or small values. This is reflected by examining the coefficient of variation (CV) graphs. Generally, the largest sample sizes provided the most reliable averages, those with the lowest CV percentage. The CVs are also a good measure of homogeneity of an area, in this case, ARAs. We see that ARA 7 has a large number of reports, relative to ARAs 5 and 6, and yet the CV tends to be greater. This would imply that relative to ARA 7, ARAs 5 and 6 are generally more homogeneous. This type of observation can be made between crops in any area.

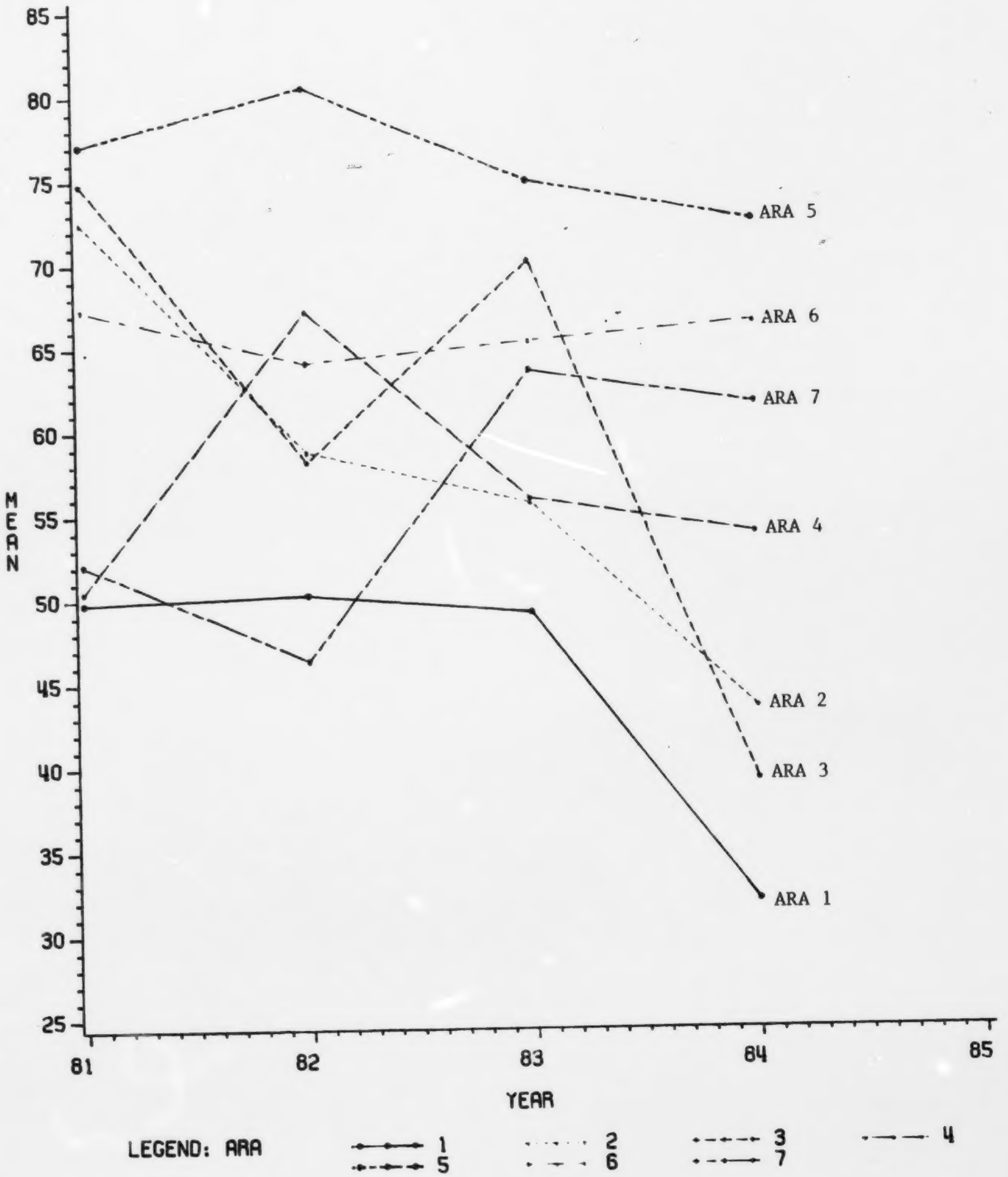
AVERAGE CROP YIELDS FOR CWRS, PER ARA, 81-84



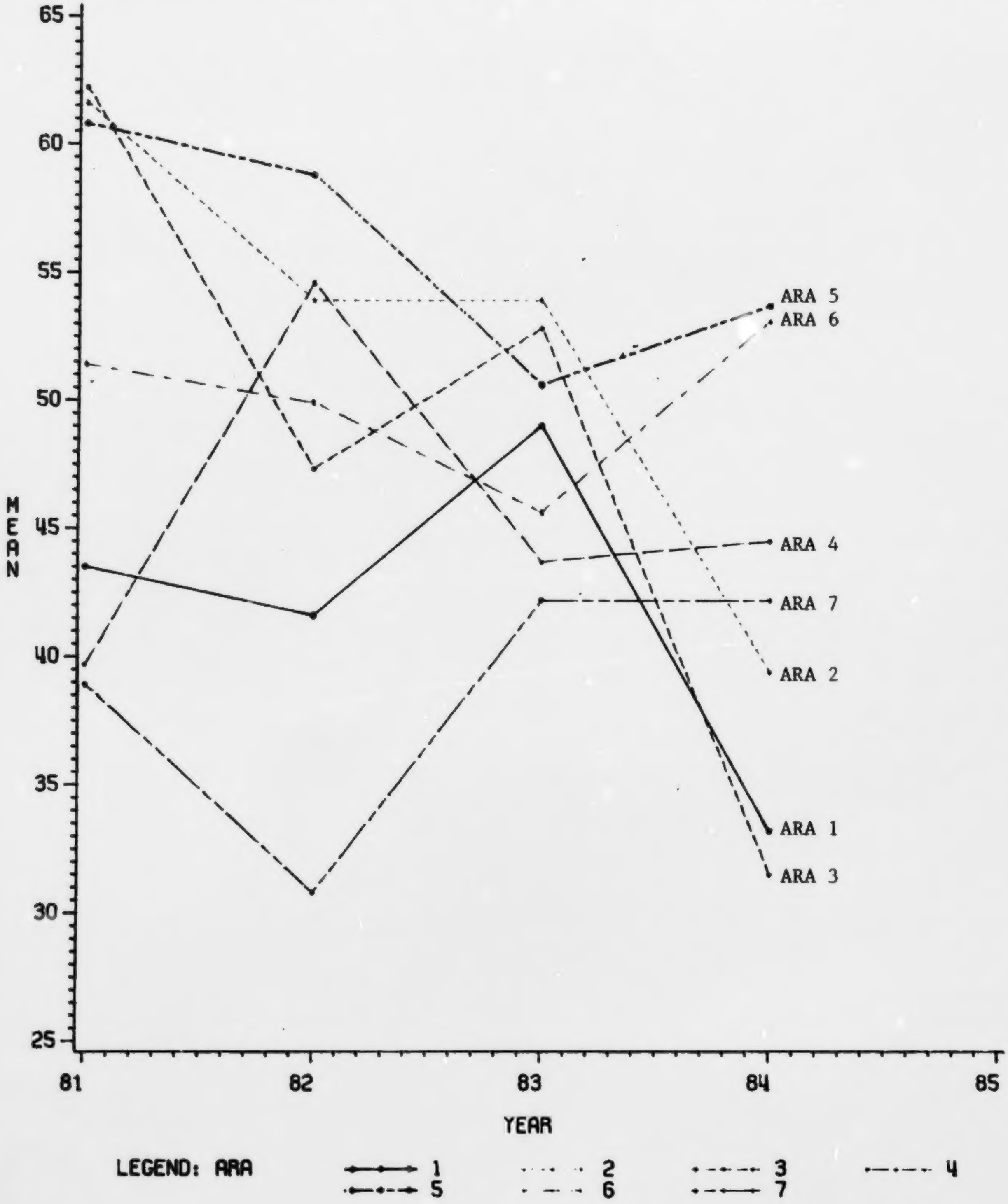
AVERAGE CROP YIELDS FOR CWRW, PER ARA, 81–84



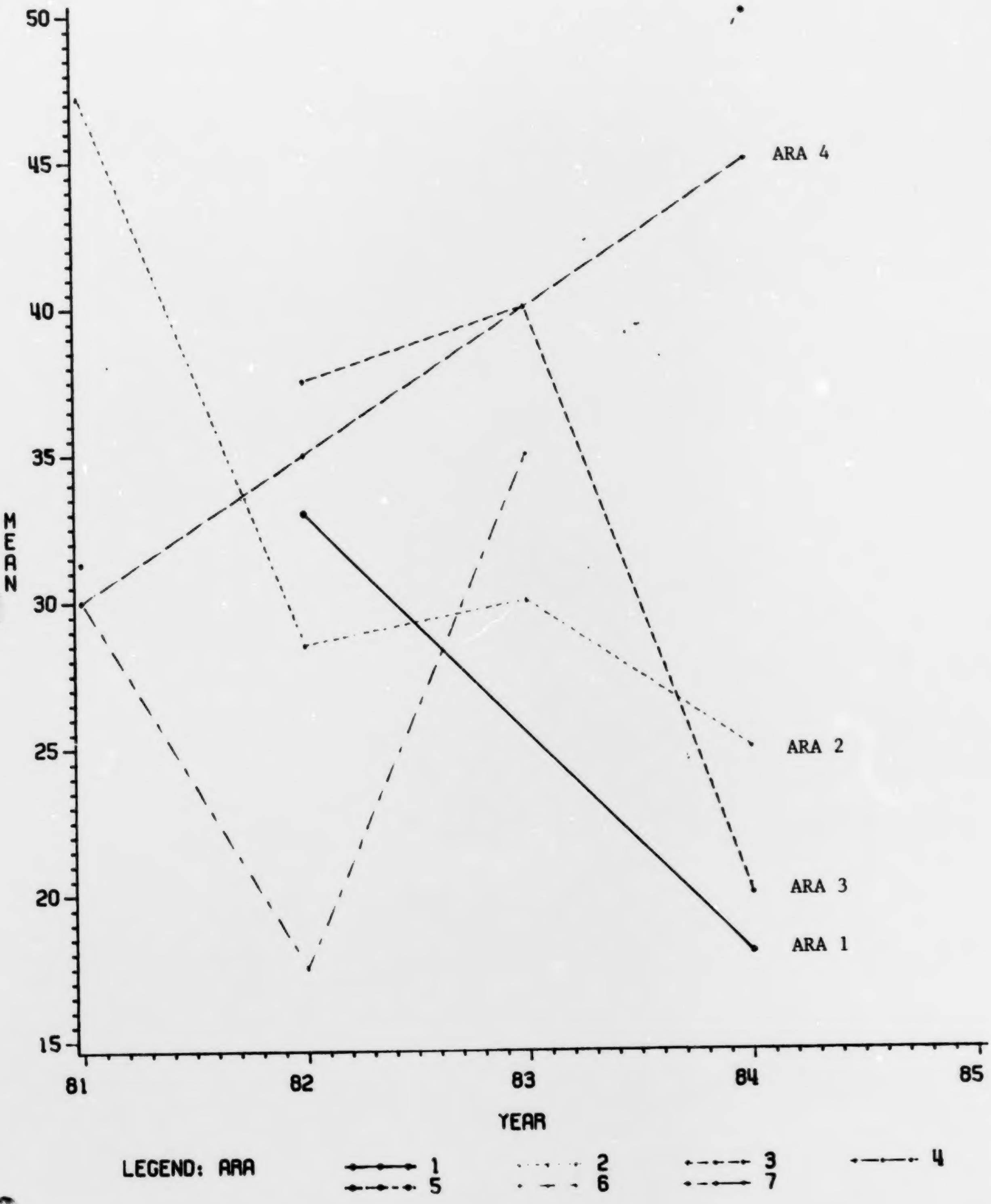
AVERAGE CROP YIELDS FOR OATS, PER ARA, 81–84



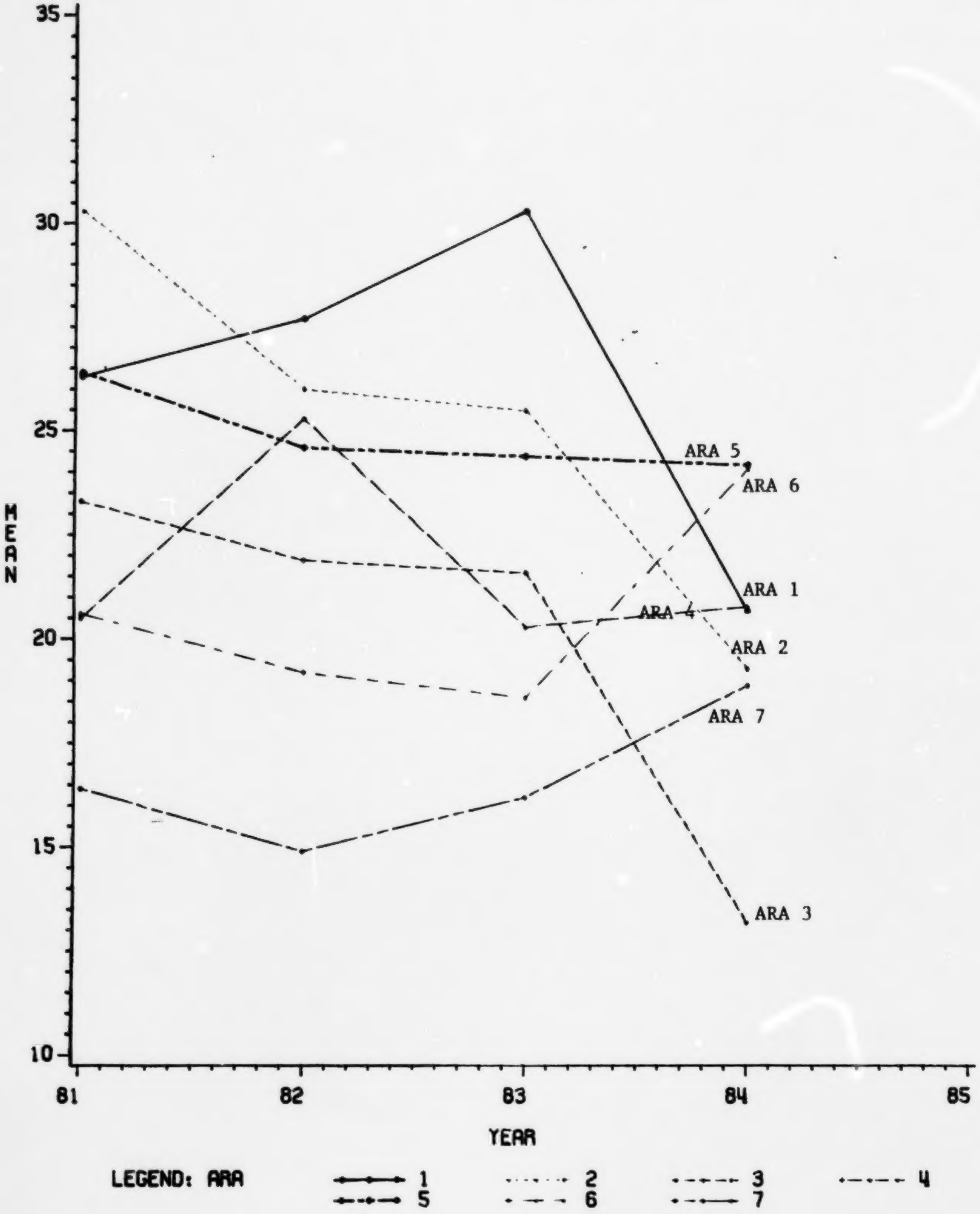
AVERAGE CROP YIELDS FOR BARLEY, PER ARA, 81–84

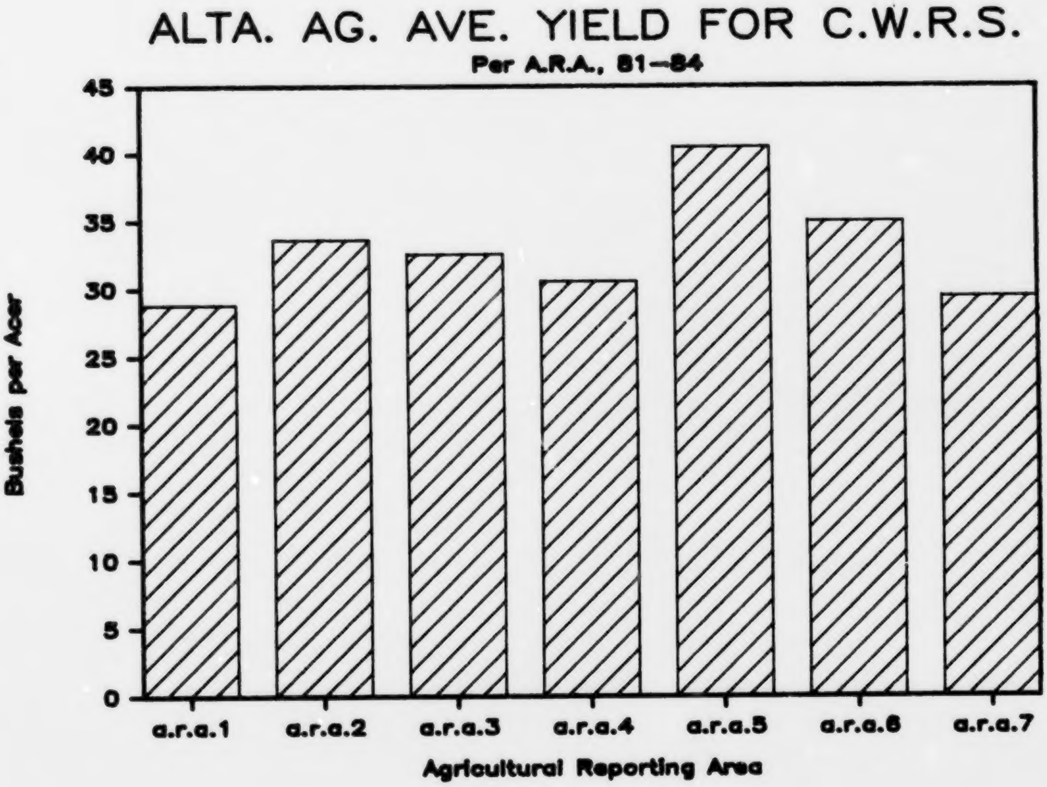


AVERAGE CROP YIELDS FOR RYE, PER ARA, 81–84



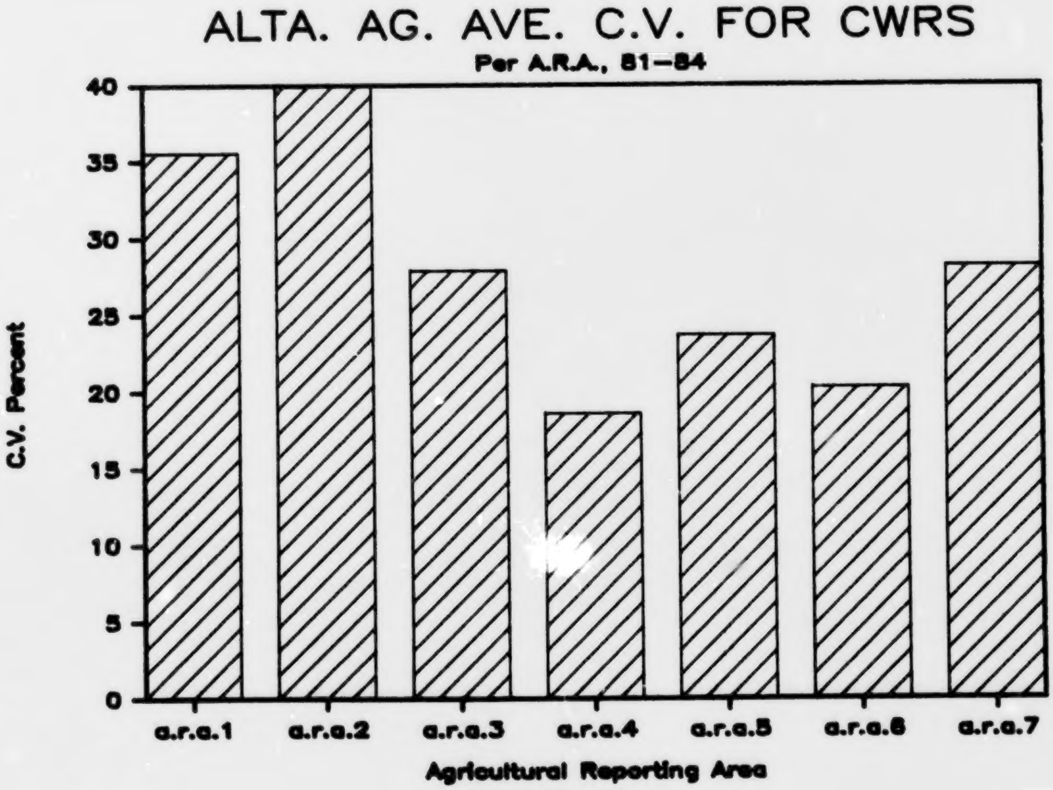
AVERAGE CROP YIELDS FOR CANOLA PER ARA, 81-84





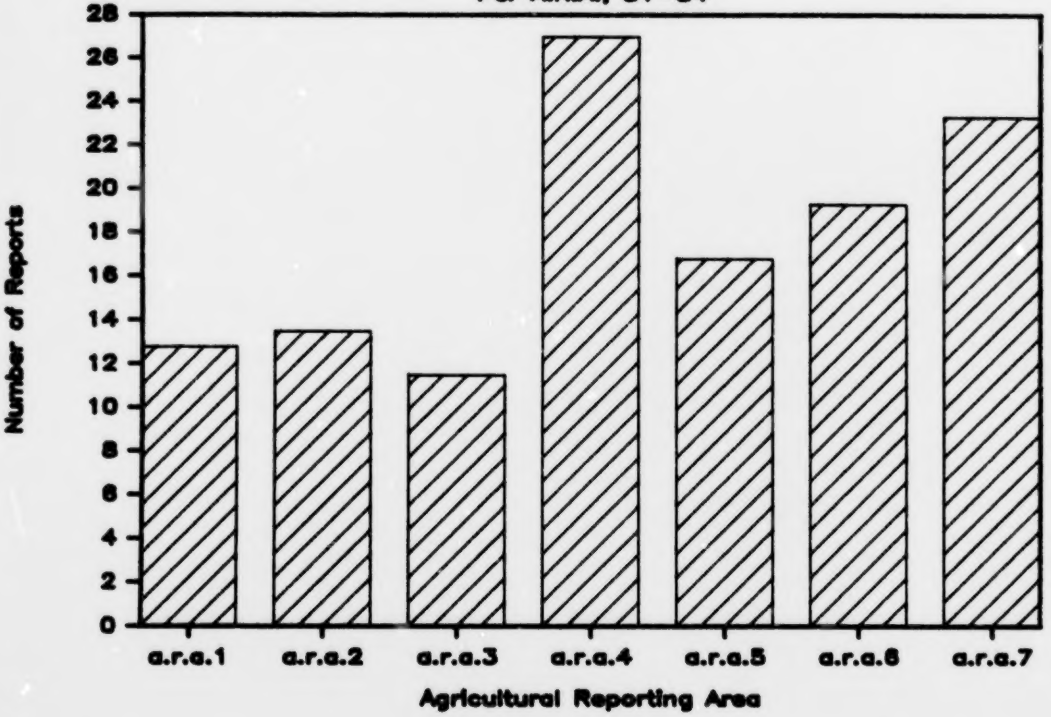
ALTA. AG. AVE. YIELD FOR C.W.R.S.

Per A.R.A., 81–84



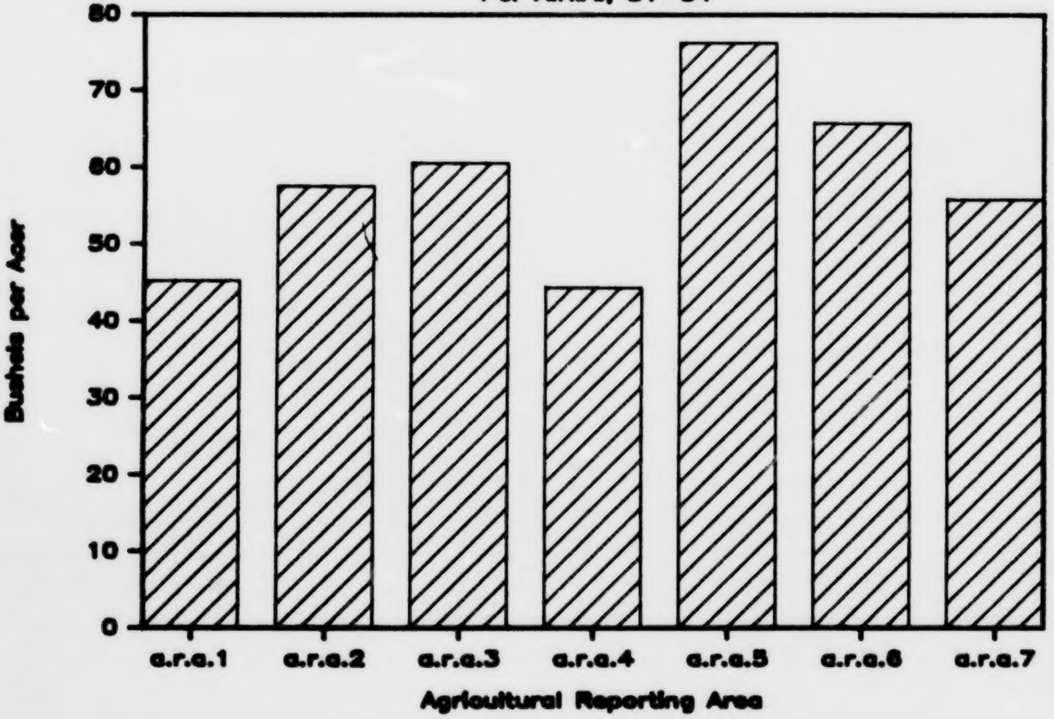
ALTA. AG. AVE. C.V. FOR CWRS

Per A.R.A., 81–84



ALTA. AG. AVE. REPORTS FOR C.W.R.S.

Per A.R.A., 81–84

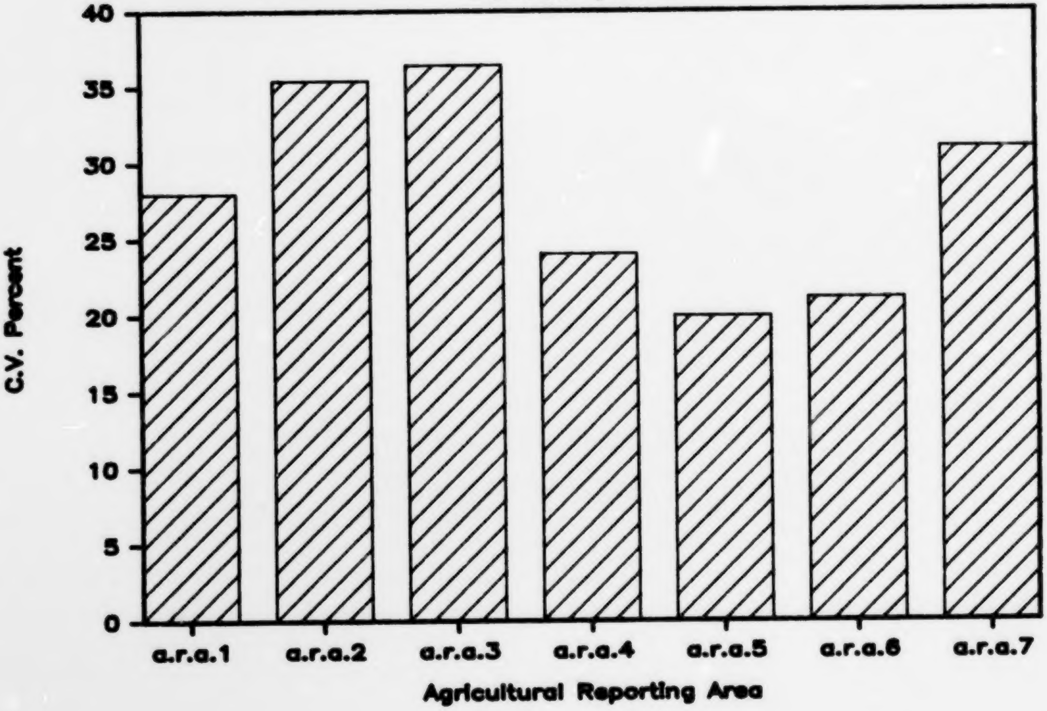


ALTA. AG. AVE. YIELD FOR OATS

Per A.R.A., 81–84

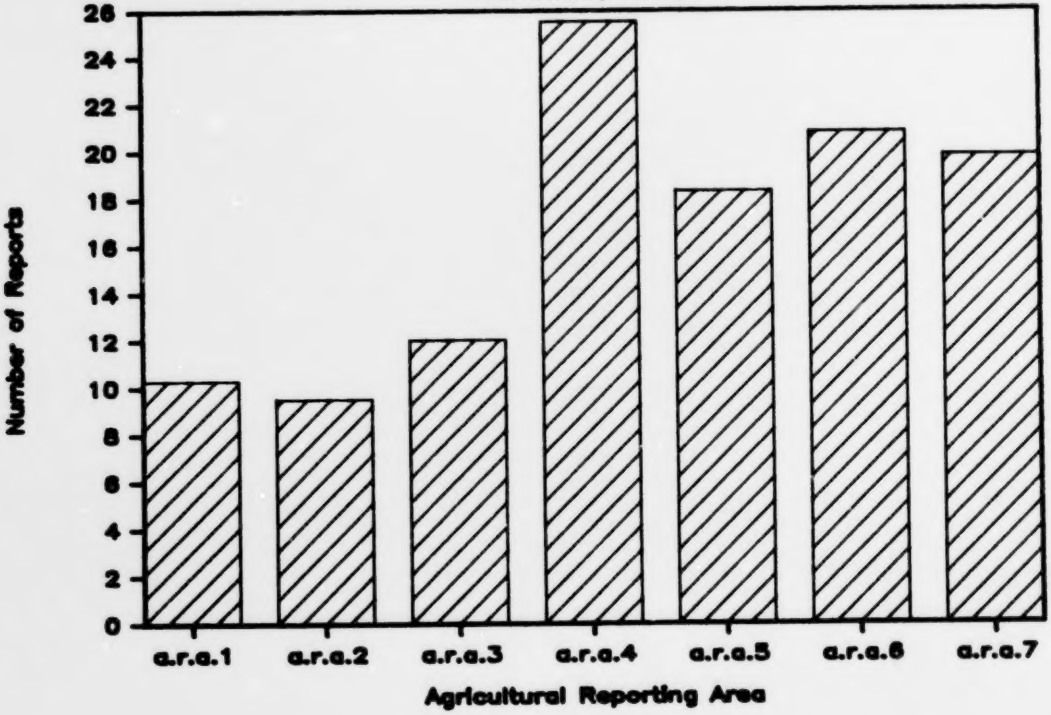
ALTA. AG. AVE. C.V. FOR OATS

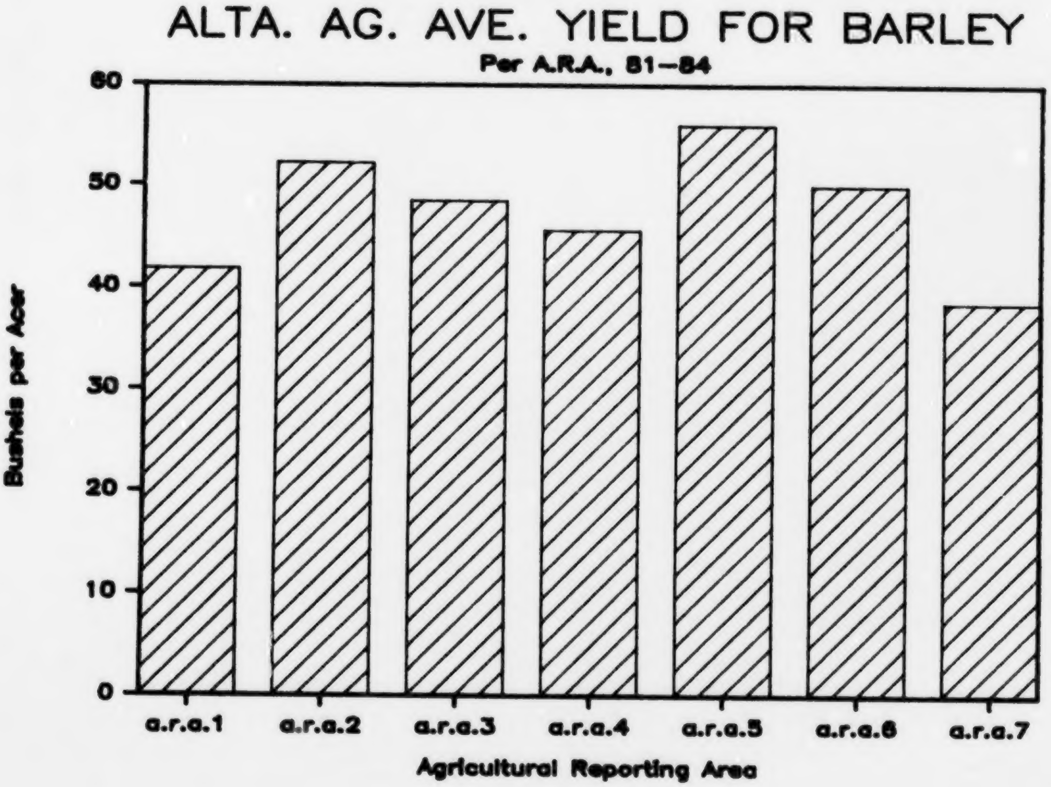
Per A.R.A., 81–84

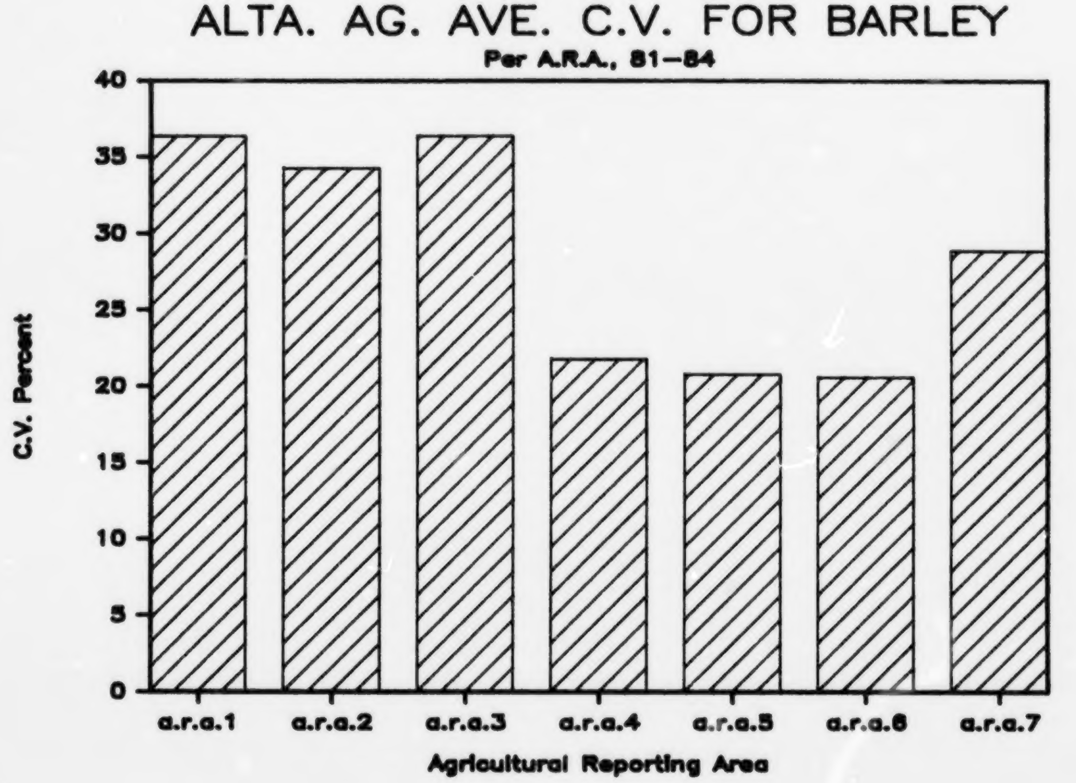


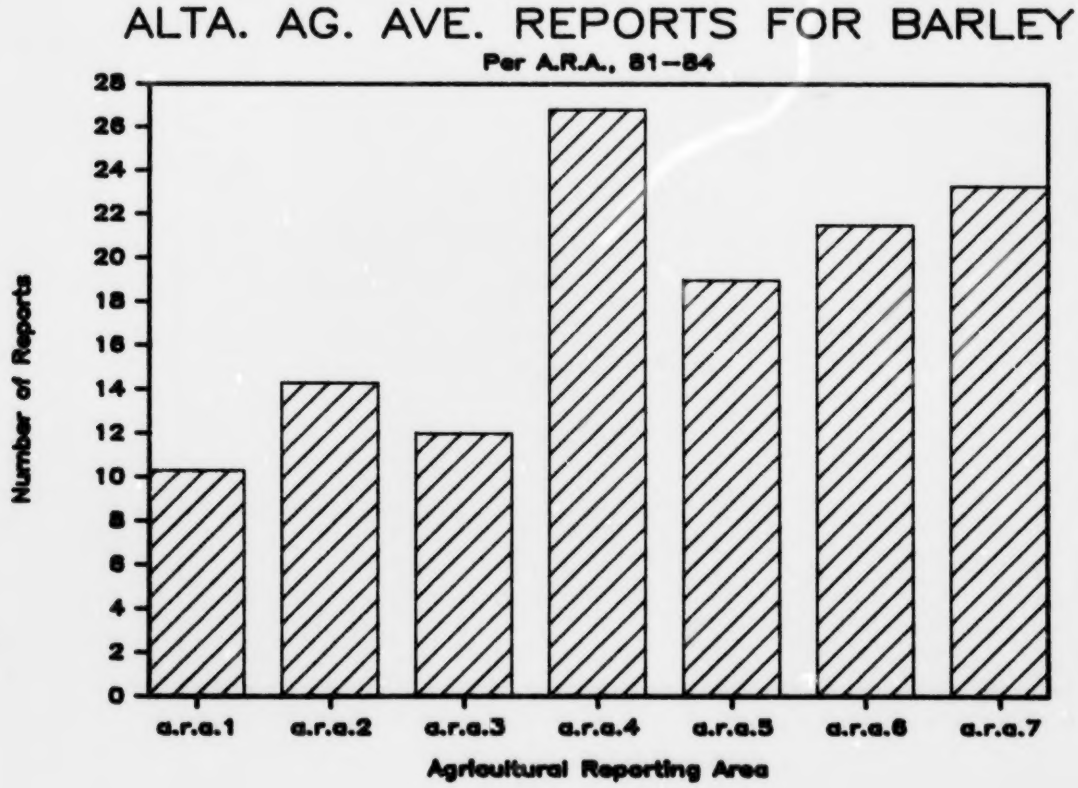
ALTA. AG. AVE. REPORTS FOR OATS

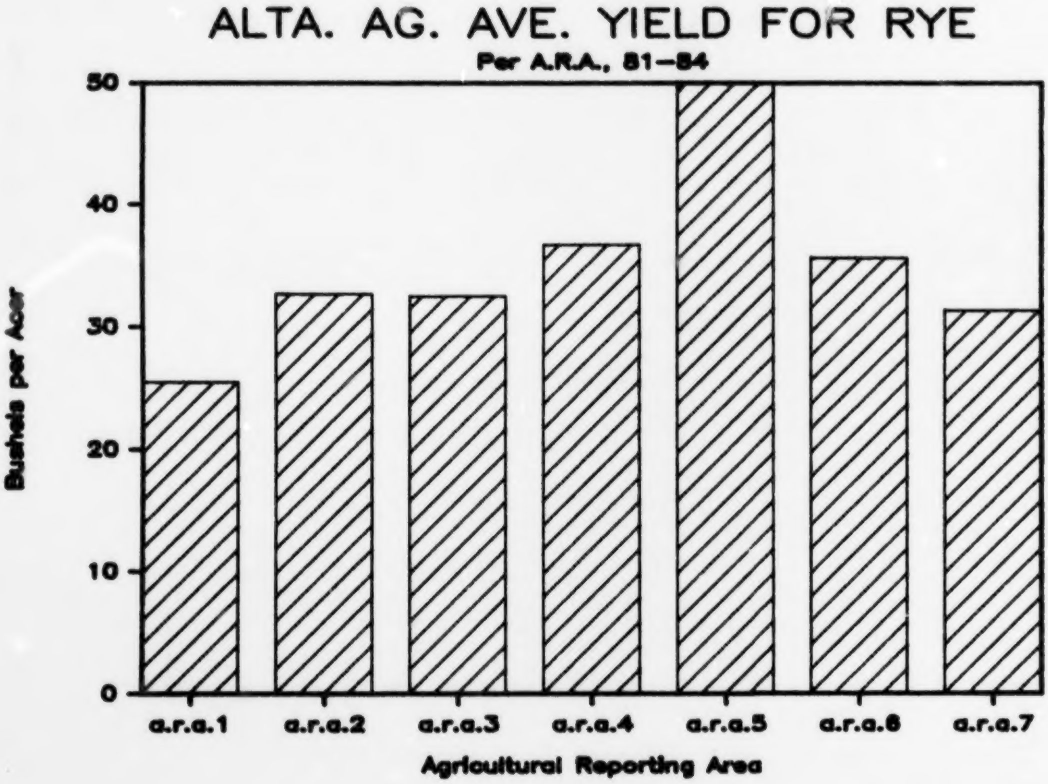
Per A.R.A., 81–84



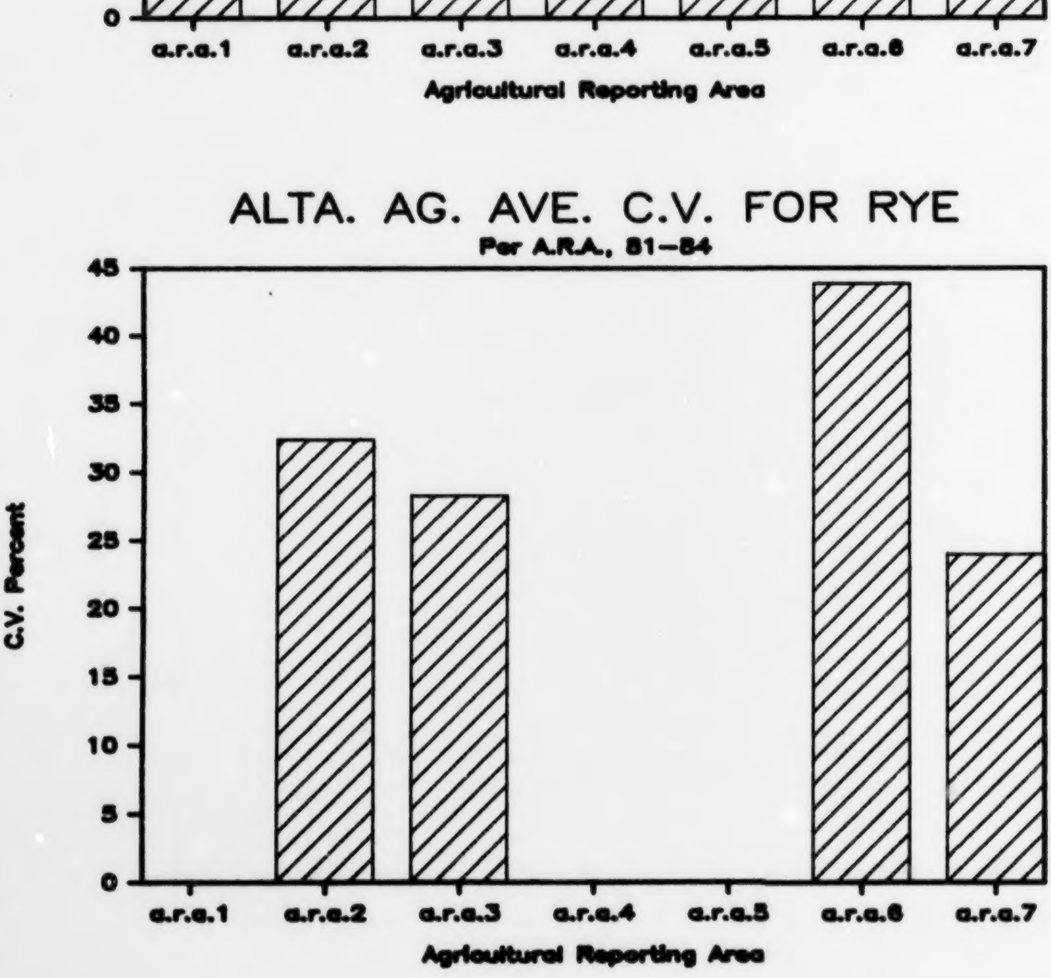

ALTA. AG. AVE. YIELD FOR BARLEY
Per A.R.A., 81-84
Bushels per Acer
60
50
40
30
20
10
0
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area


ALTA. AG. AVE. C.V. FOR BARLEY
Per A.R.A., 81–84
C.V. Percent
0
5
10
15
20
25
30
35
40
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area

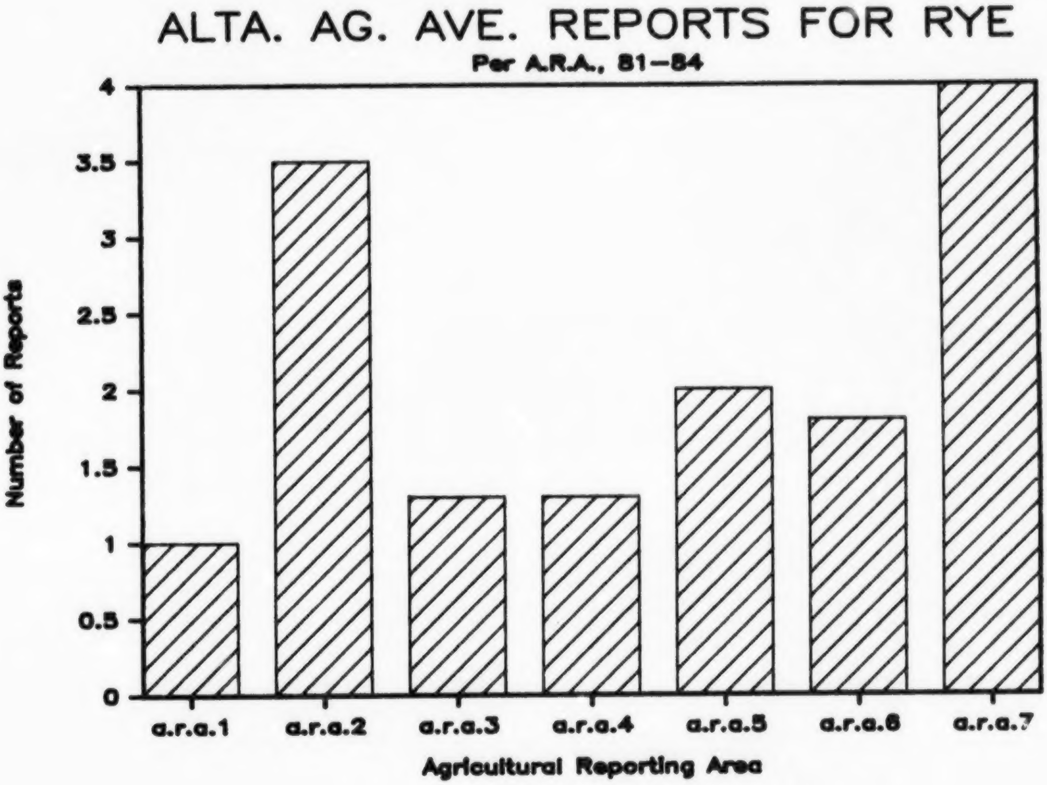

ALTA. AG. AVE. REPORTS FOR BARLEY
Per A.R.A., 81–84
Number of Reports
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area

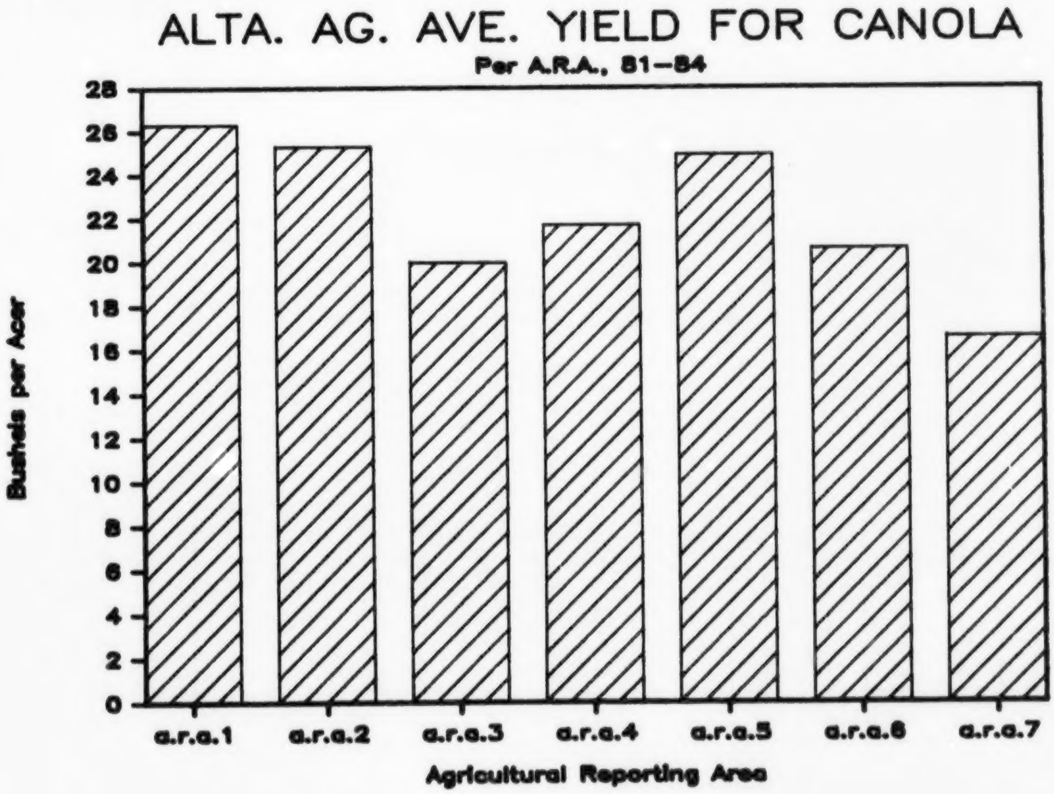


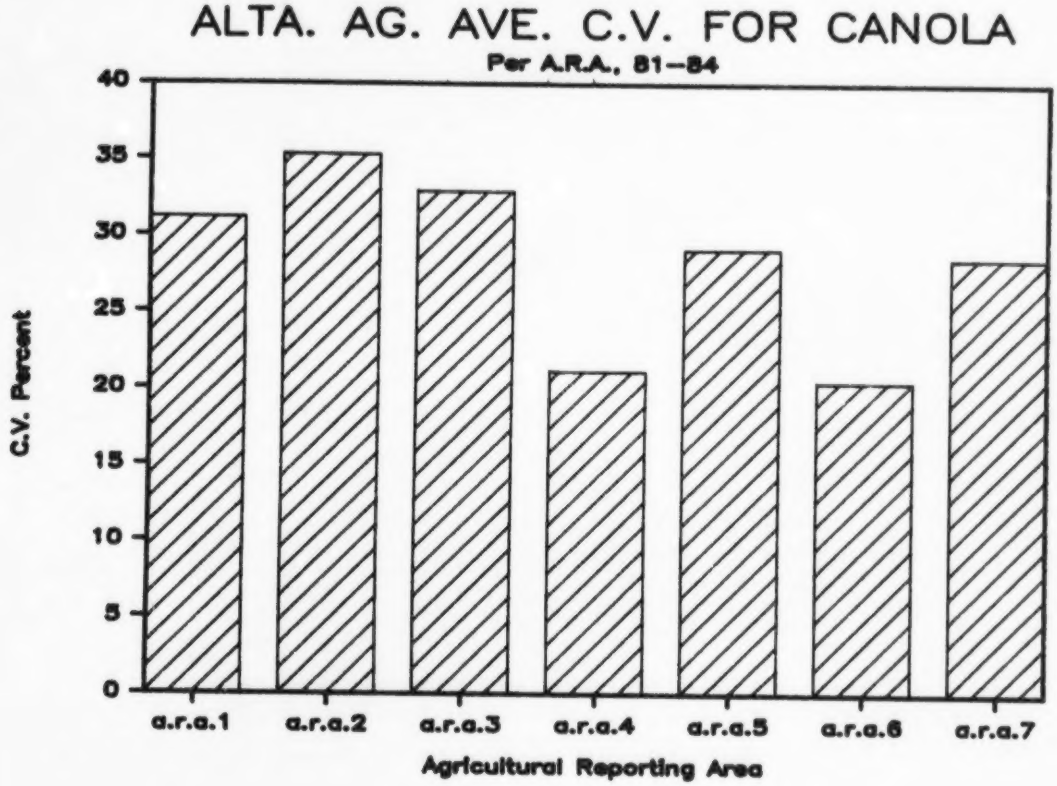
ALTA. AG. AVE. YIELD FOR RYE
Per A.R.A., 81–84
Bushels per Acer
50
40
30
20
10
0
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area

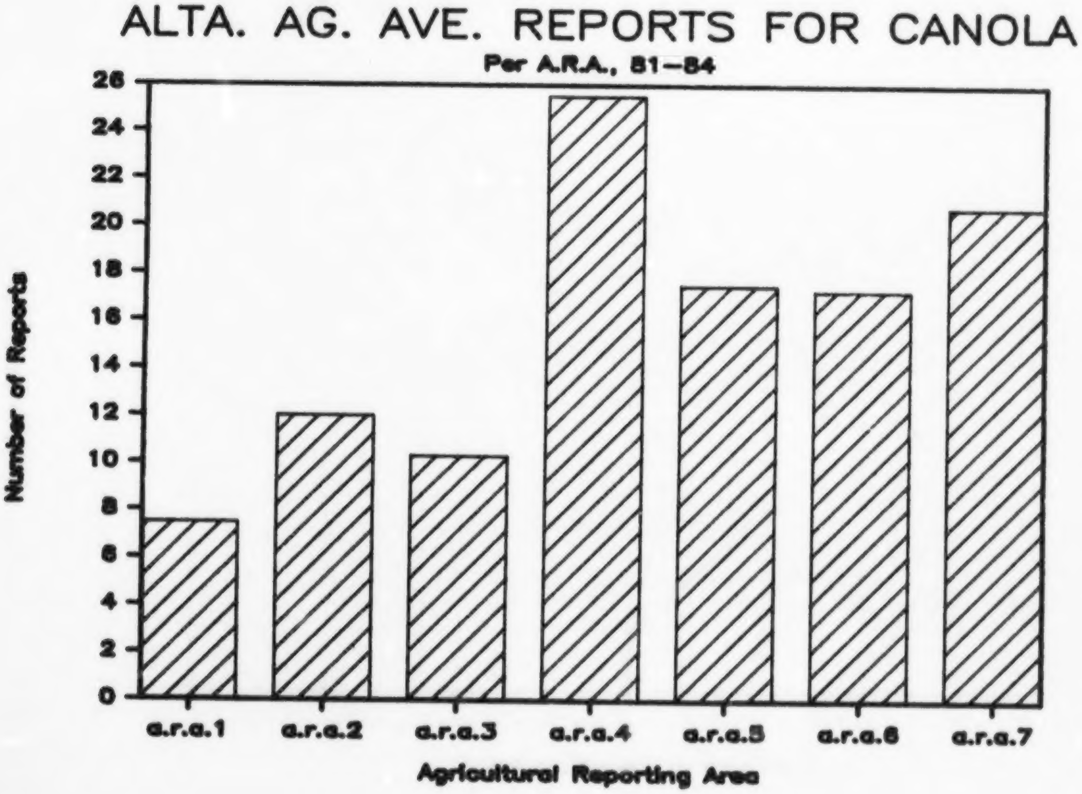


ALTA. AG. AVE. C.V. FOR RYE
Per A.R.A., 81–84
C.V. Percent
45
40
35
30
25
20
15
10
5
0
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area


ALTA. AG. AVE. REPORTS FOR RYE
Per A.R.A., 81–84
Number of Reports
0
0.5
1
1.5
2
2.5
3
3.5
4
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area


ALTA. AG. AVE. YIELD FOR CANOLA
Per A.R.A., 81–84
Bushels per Acer
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area


ALTA. AG. AVE. C.V. FOR CANOLA
Per A.R.A., 81–84
C.V. Percent
40
35
30
25
20
15
10
5
0
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area

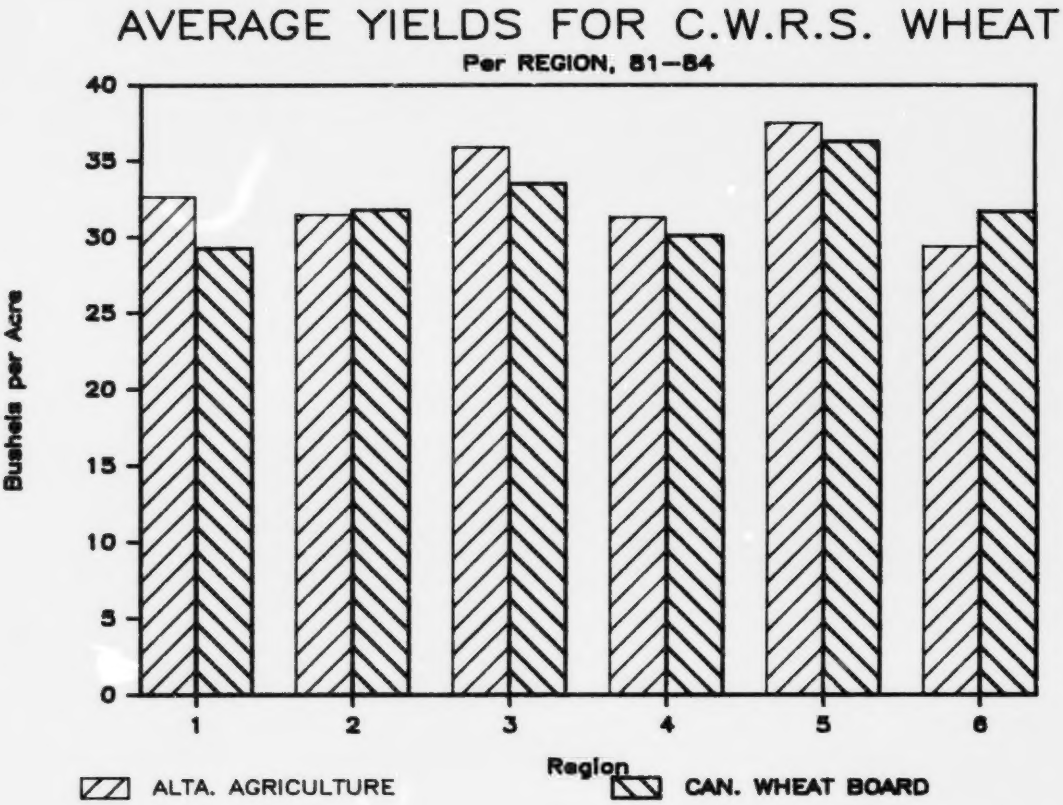

ALTA. AG. AVE. REPORTS FOR CANOLA
Per A.R.A., 81–84
Number of Reports
26
24
22
20
18
16
14
12
10
8
6
4
2
0
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area

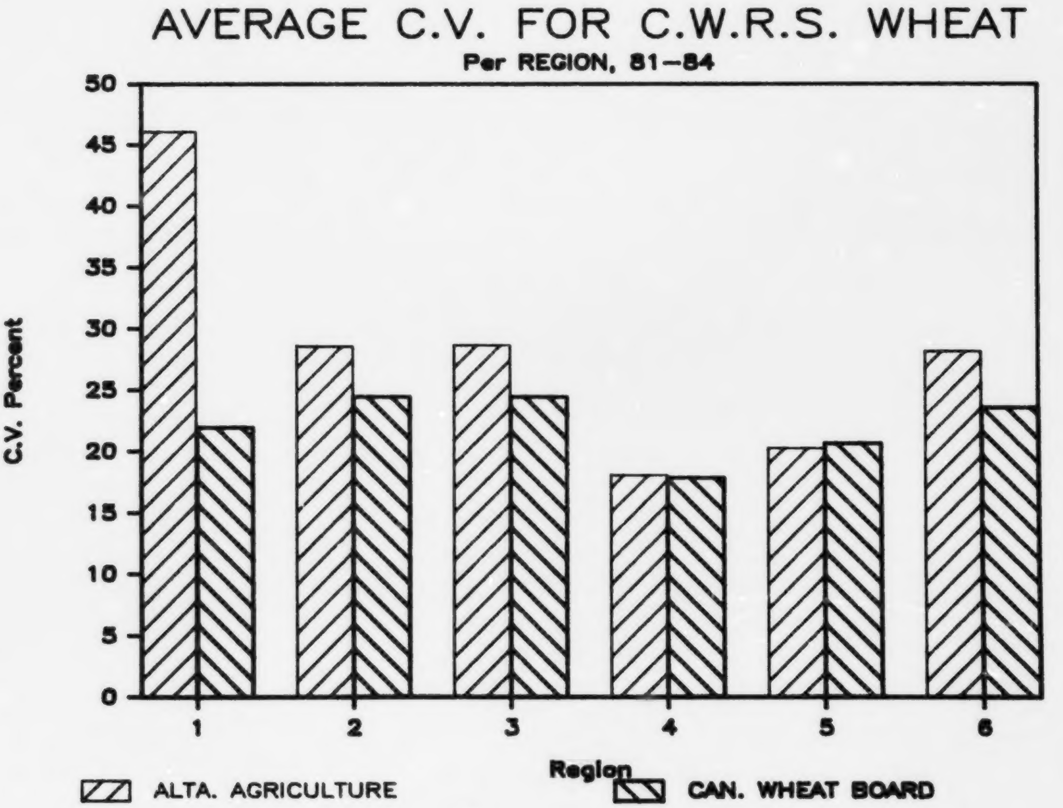
IV. 4-Year Average Comparison of Canadian Wheat Board Data with Alberta Agriculture Data, for Selected Crops, by Region and ARA

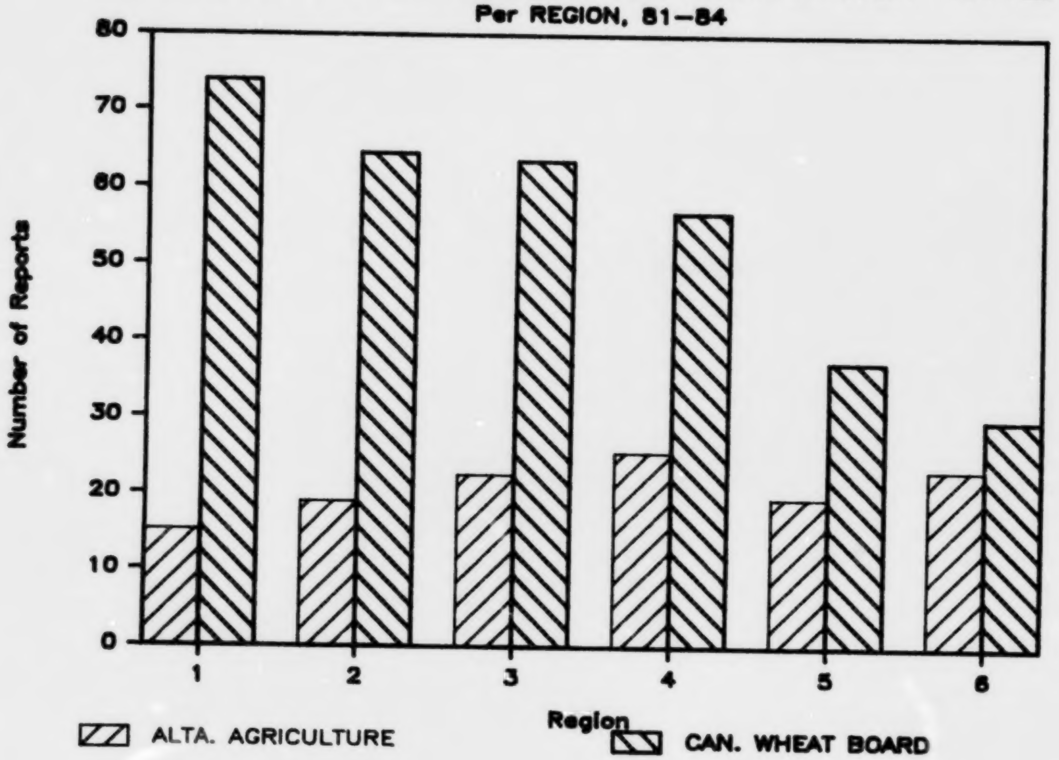
Section IV Highlights

Section IV compares the two raw data sets used in this study, data obtained from CWB elevator agent surveys and Alberta Agriculture Crop Report questionnaires. Four-year average yields, CVs and number of reports are calculated at both the ARA and Region levels.

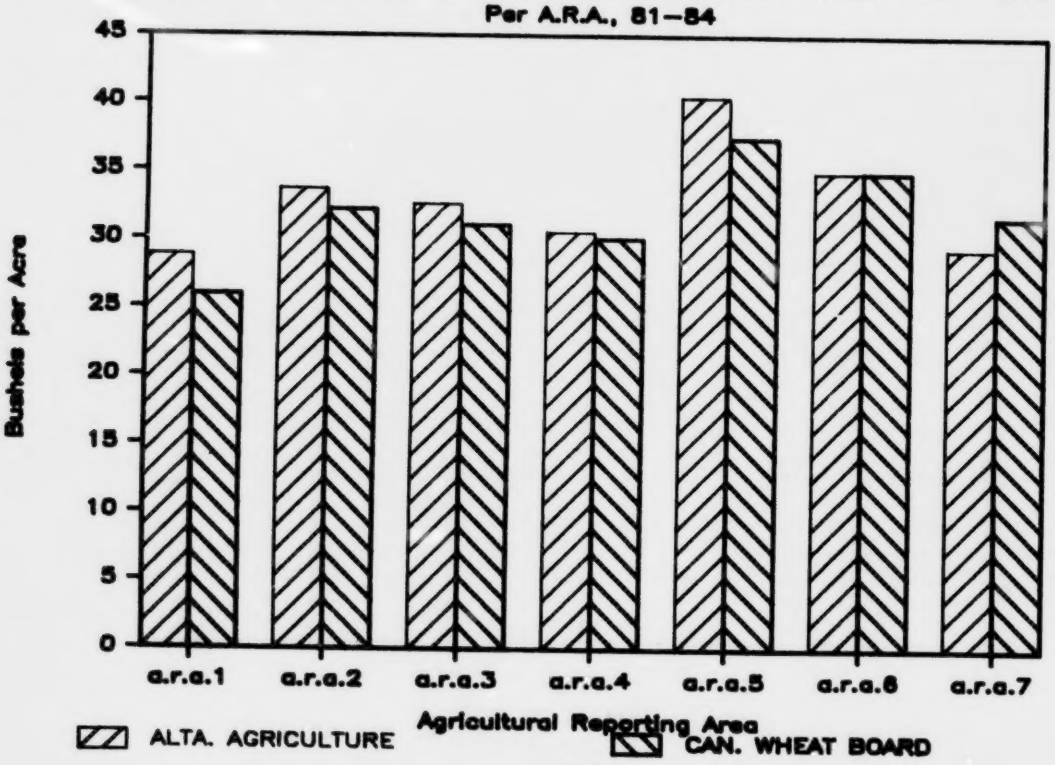
CWB and Alberta Agriculture data generate average CWRS wheat yields that are very similar. The greatest differences were found in Region 1 and ARA 5 where the means differed by about 3 bushels per acre (about 10%). The CVs were generally larger for Alberta Agriculture data, likely because fewer reports were available for each area. Differences between the two Regional oat yield estimates varied but were consistently less than 5 bushels (less than 10%). A difference at the ARA level was greater in one instance, in ARA 4, where the averages were over 6 bushels per acre apart. The CVs in most cases were higher for Alberta Agriculture data likely because the CWB data set was larger at all levels. Barley yield estimates were very similar in most cases, with generally less than 4 bushels per acre difference. Region 1 results showed the greatest discrepancy, over 13 bushels per acre, and the highest CVs (30-40%). Estimates of canola yields were lower using CWB data in all cases but one. This may reflect some respondent bias. The largest discrepancy was noted for ARA 1, where the difference between the two estimates was almost 7 bushels per acre (about 30%).


AVERAGE YIELDS FOR C.W.R.S. WHEAT
Per REGION, 81–84
Bushels per Acre
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD


AVERAGE C.V. FOR C.W.R.S. WHEAT
Per REGION, 81–84
C.V. Percent
50
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD

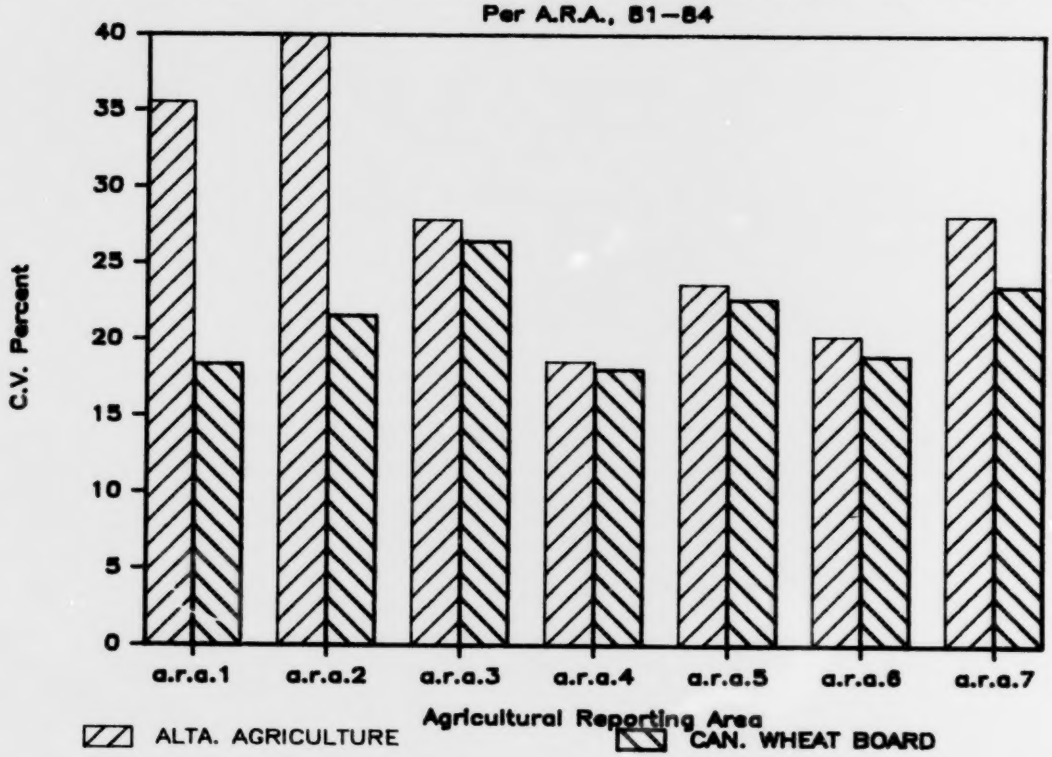

AVERAGE REPORTS FOR C.W.R.S. WHEAT

Per REGION, 81–84

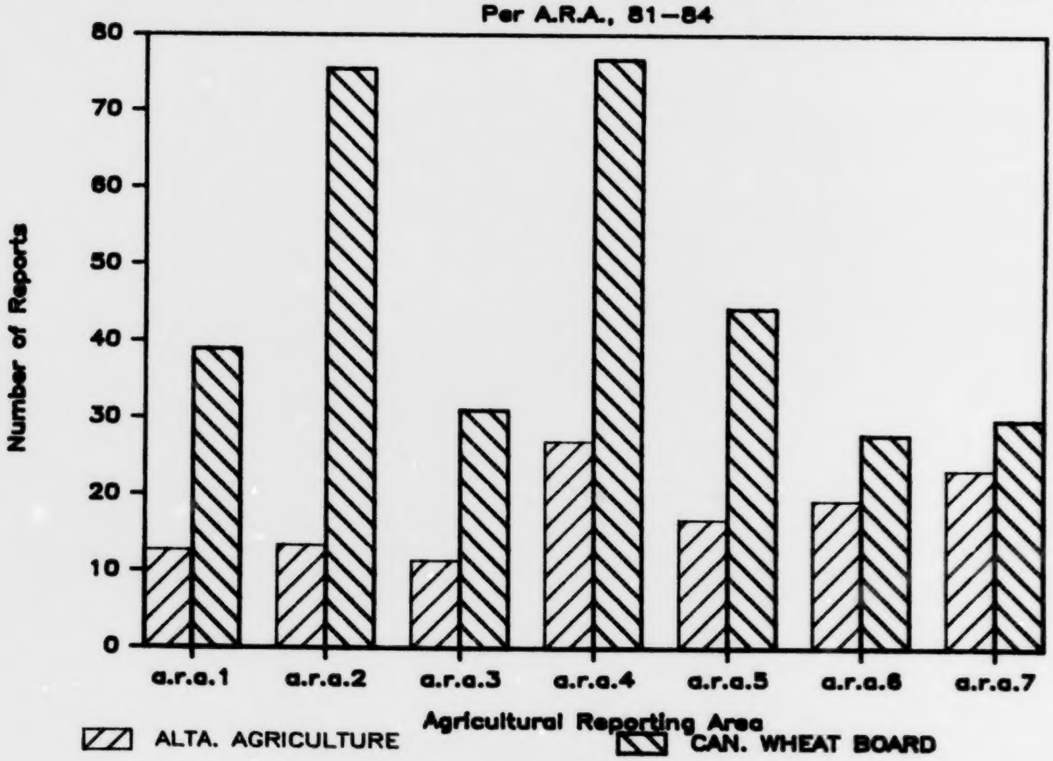

AVERAGE YIELDS FOR C.W.R.S. WHEAT

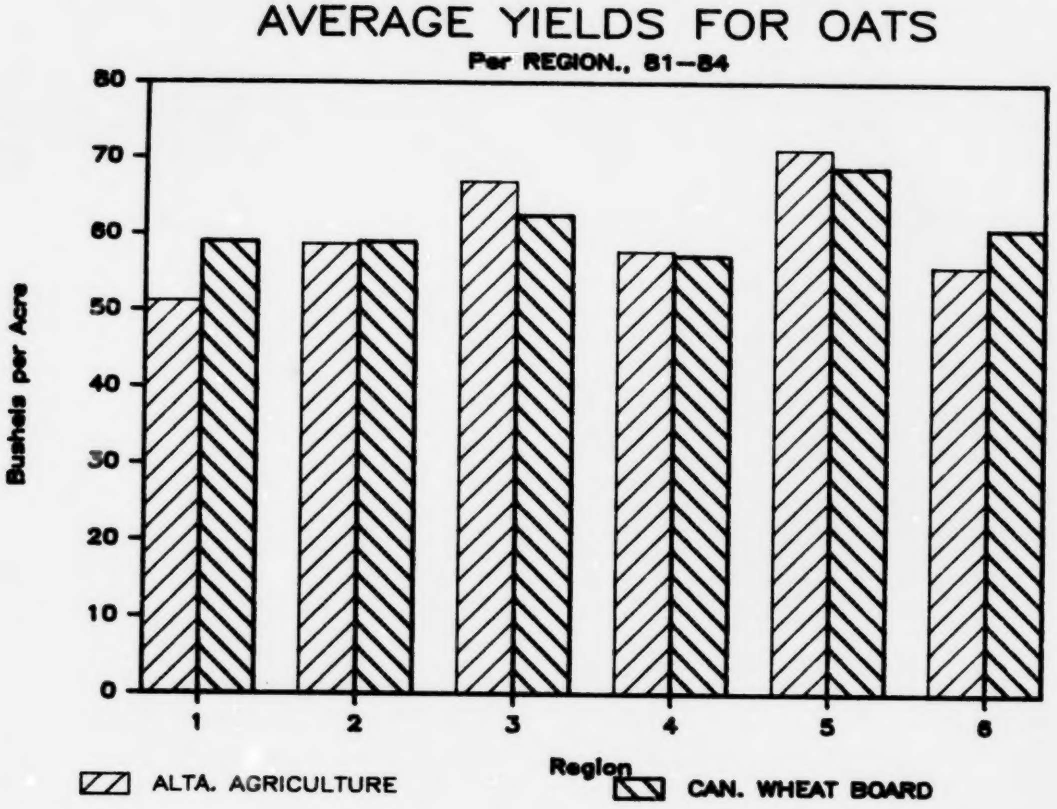
Per A.R.A., 81–84

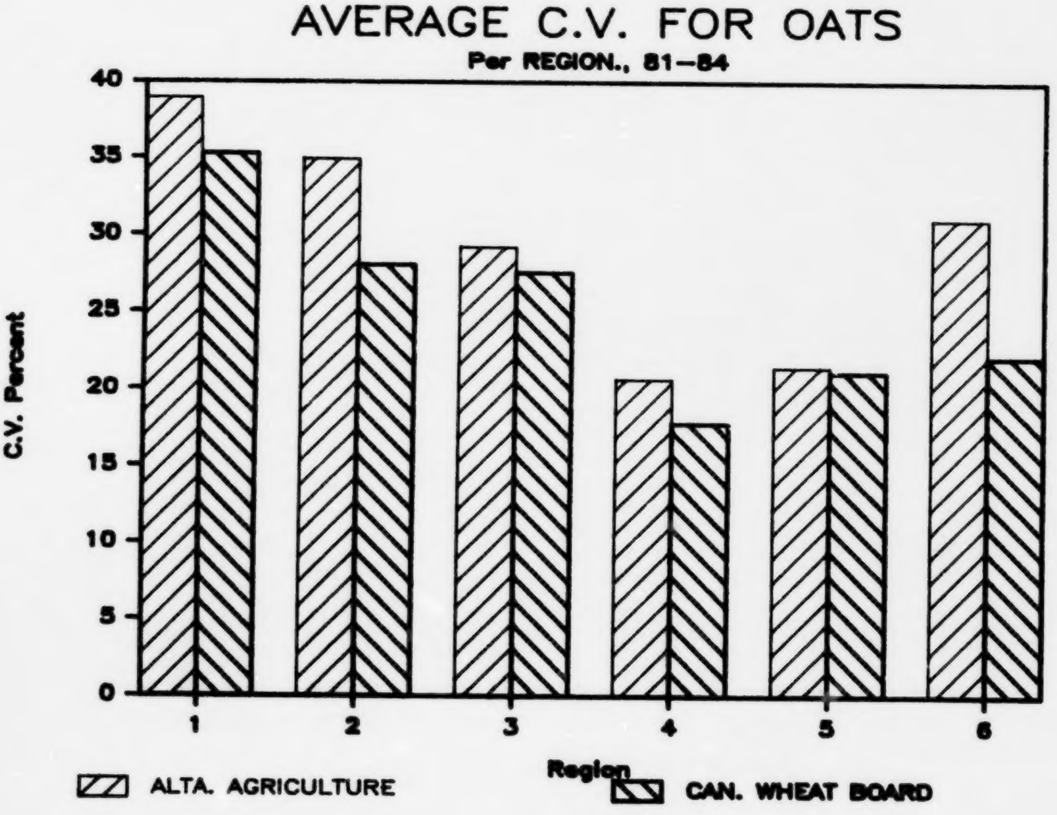
AVERAGE C.V. FOR C.W.R.S. WHEAT



AVERAGE REPORTS FOR C.W.R.S. WHEAT

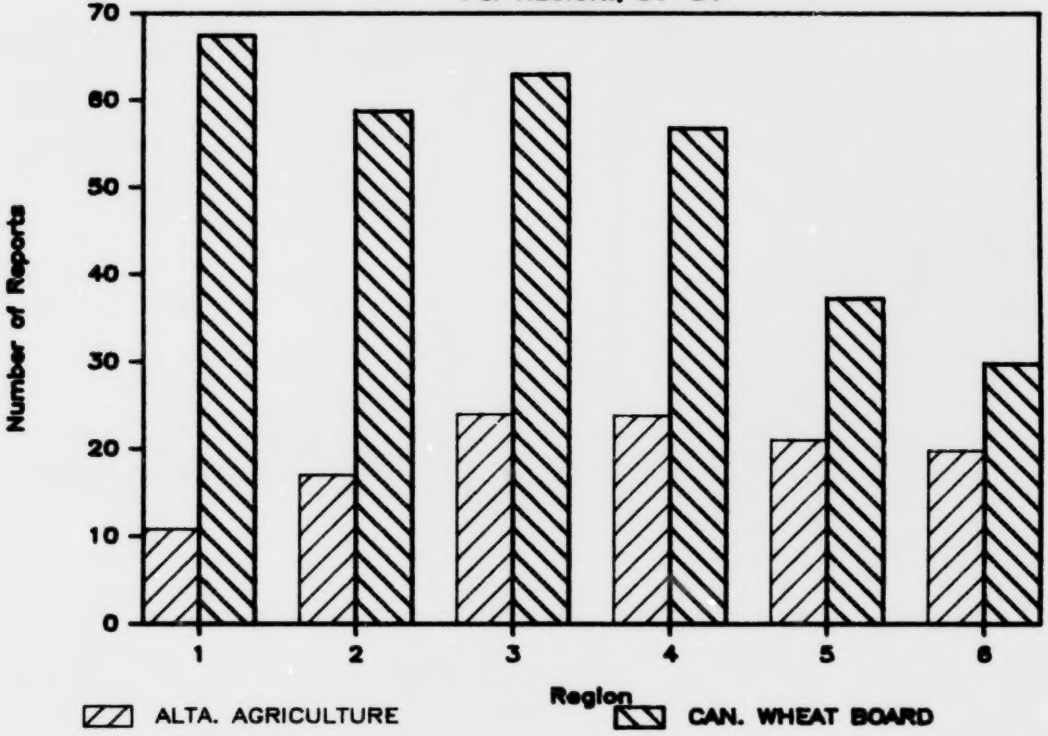



AVERAGE YIELDS FOR OATS
Per REGION., 81–84
Bushels per Acre
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD


AVERAGE C.V. FOR OATS
Per REGION., 81–84
C.V. Percent
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD

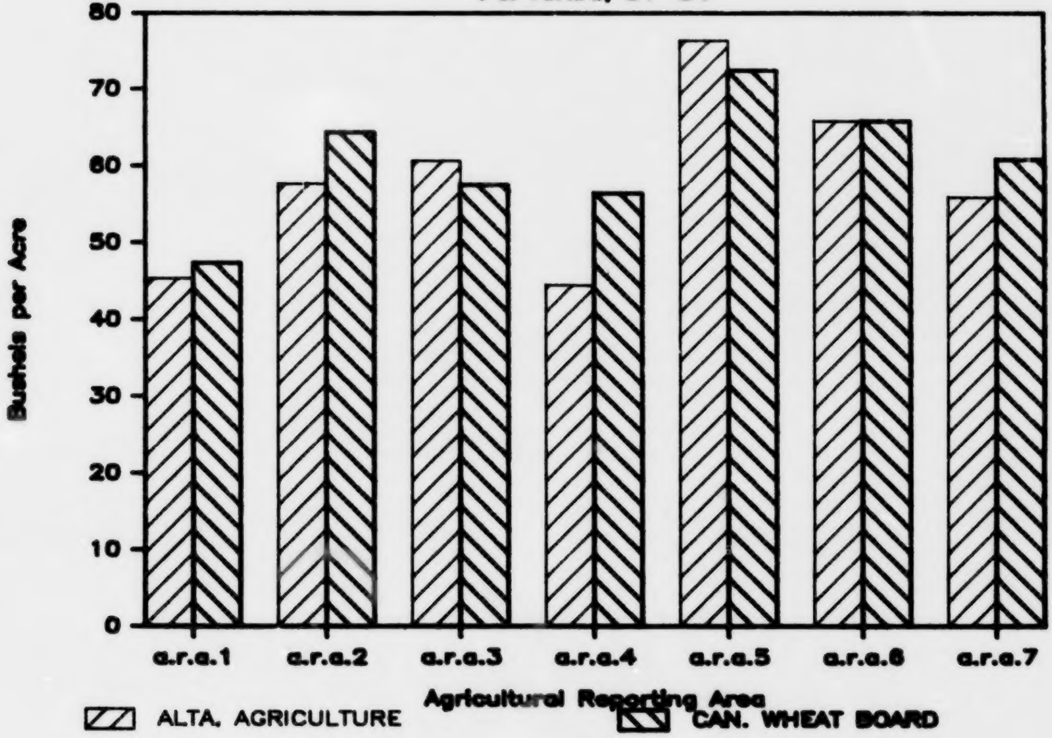
AVERAGE REPORTS FOR OATS

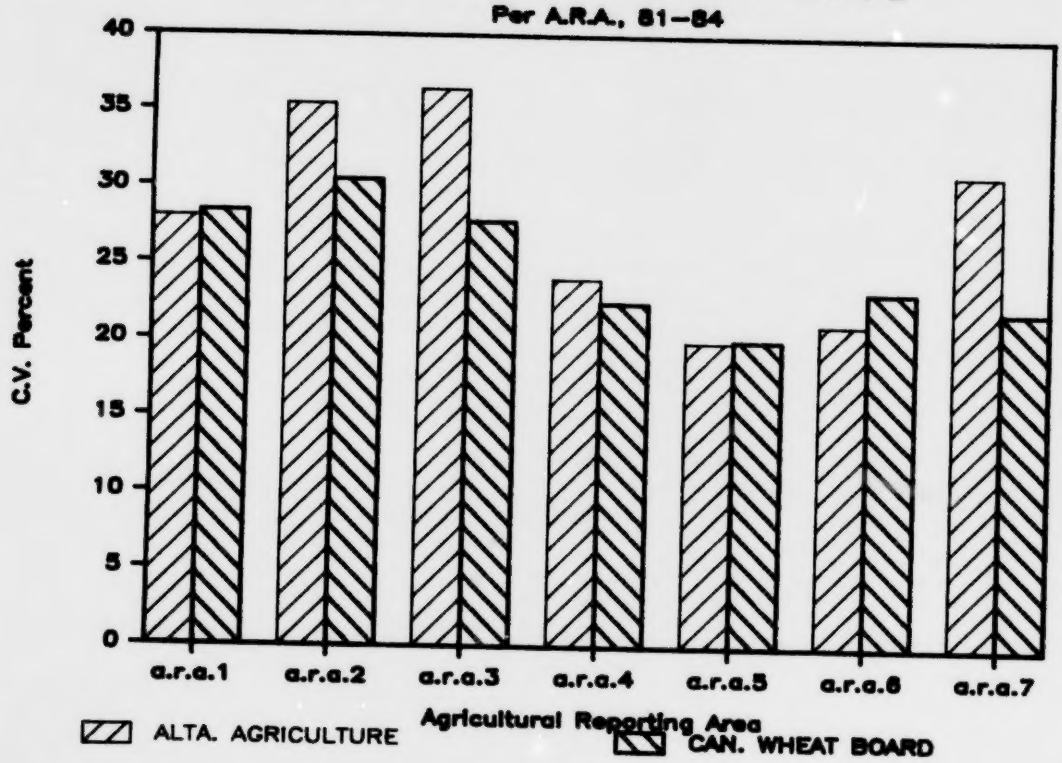
Per REGION., 81–84



AVERAGE YIELDS FOR OATS

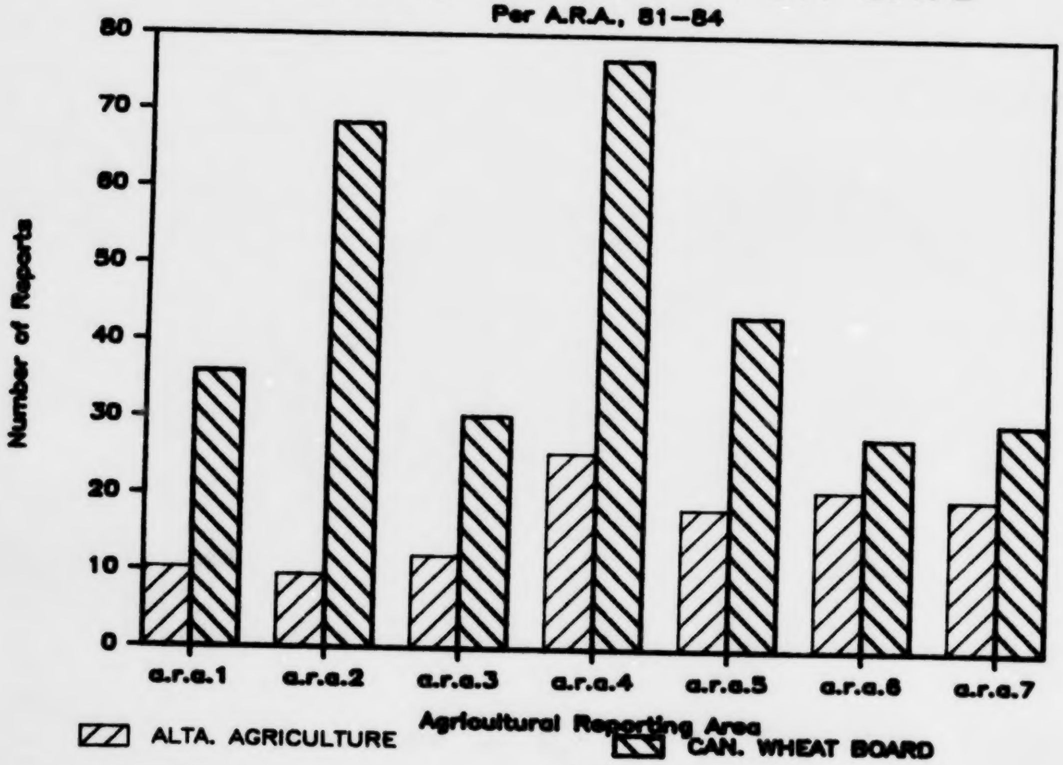
Per A.R.A., 81–84





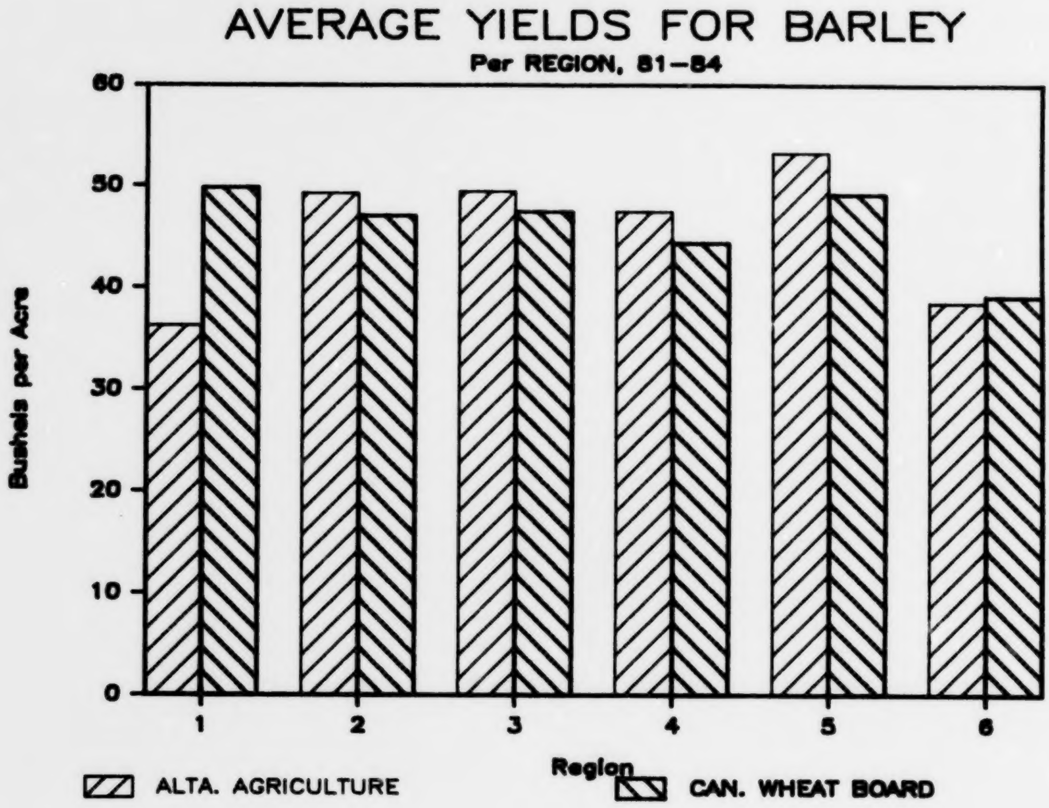
AVERAGE C.V. FOR OATS

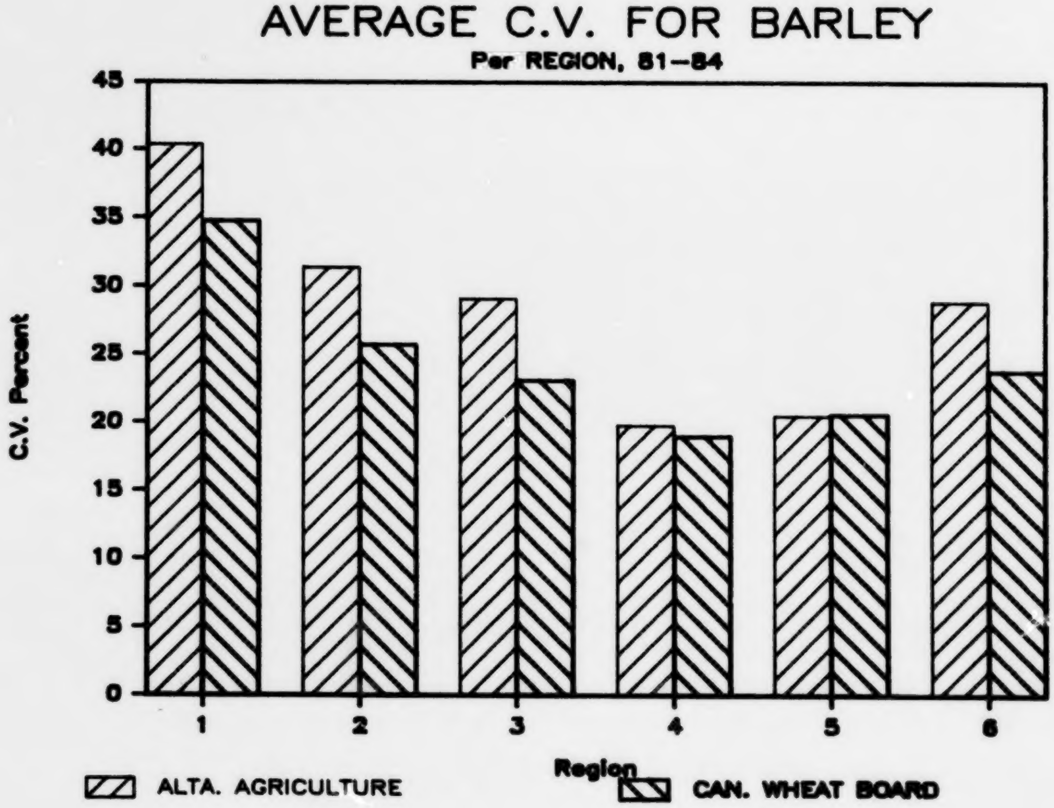
Per A.R.A., 81–84

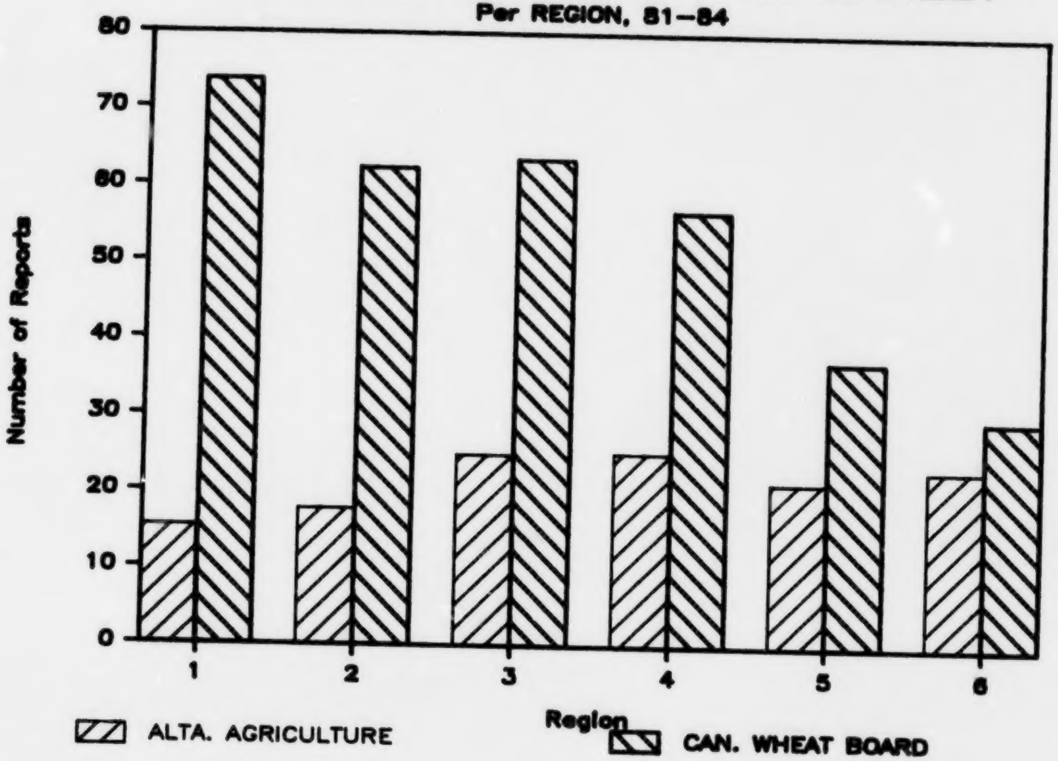


AVERAGE REPORTS FOR OATS

Per A.R.A., 81–84

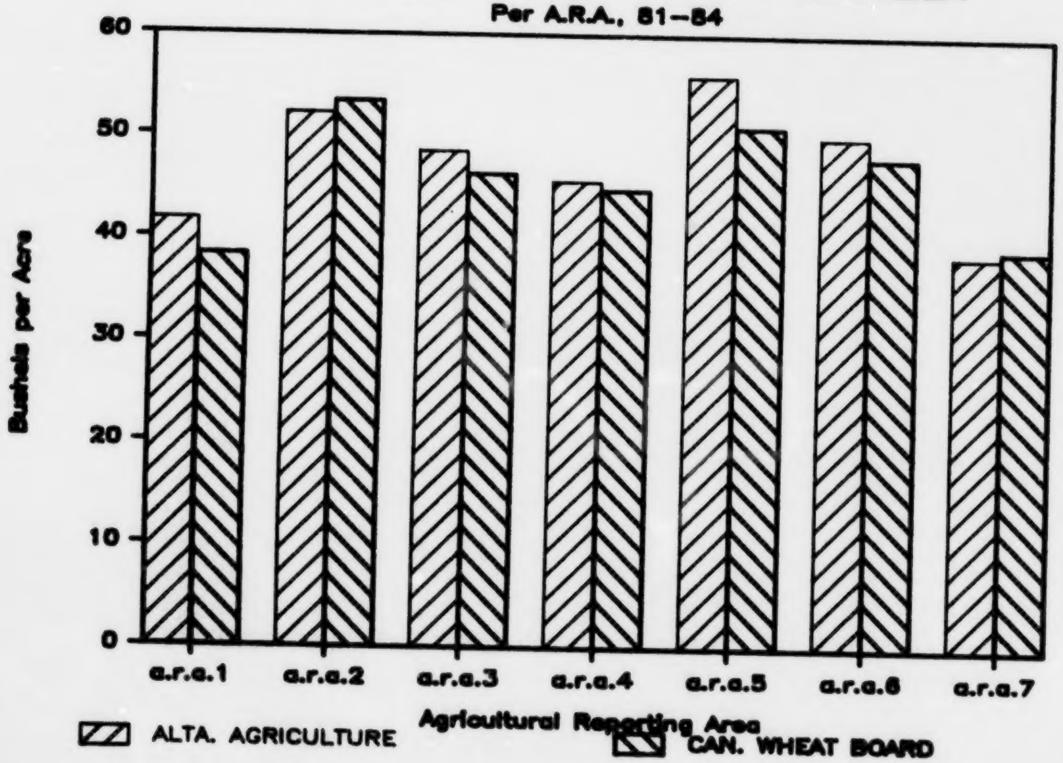

AVERAGE YIELDS FOR BARLEY
Per REGION, 81–84
Bushels per Acre
60
50
40
30
20
10
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD


AVERAGE C.V. FOR BARLEY
Per REGION, 81–84
C.V. Percent
45
40
35
30
25
20
15
10
5
0
1
2
3
4
5
6
Region
ALTA. AGRICULTURE
CAN. WHEAT BOARD



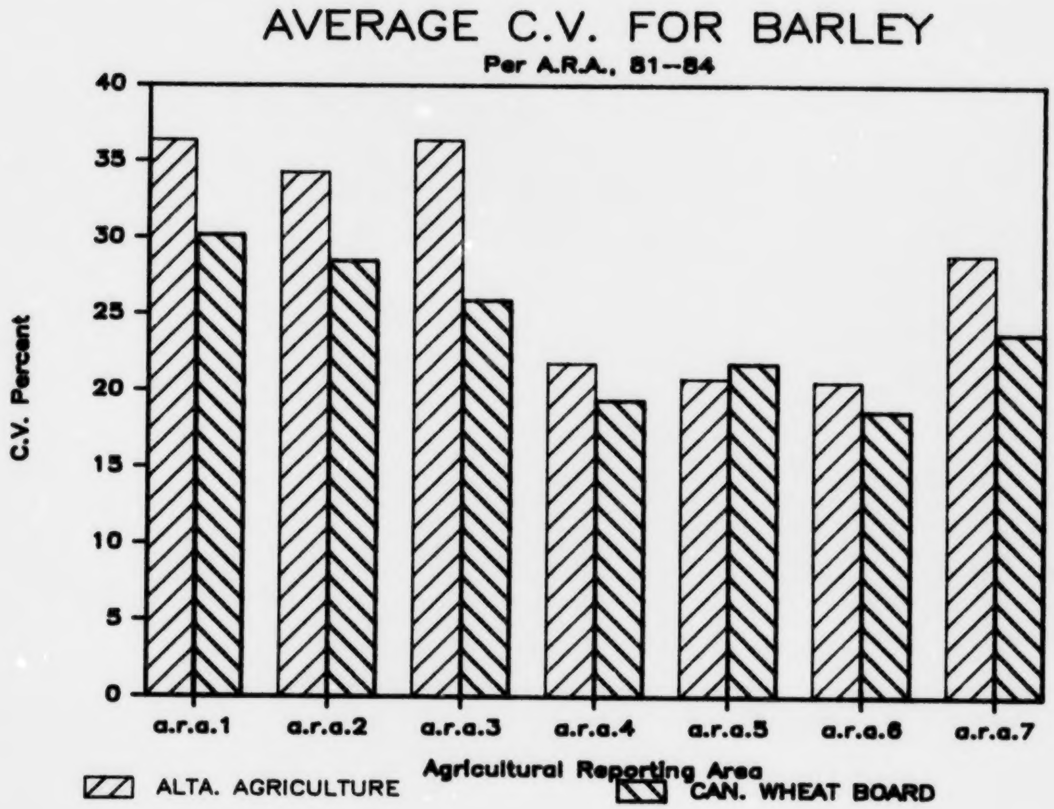
AVERAGE REPORTS FOR BARLEY

Per REGION, 81–84



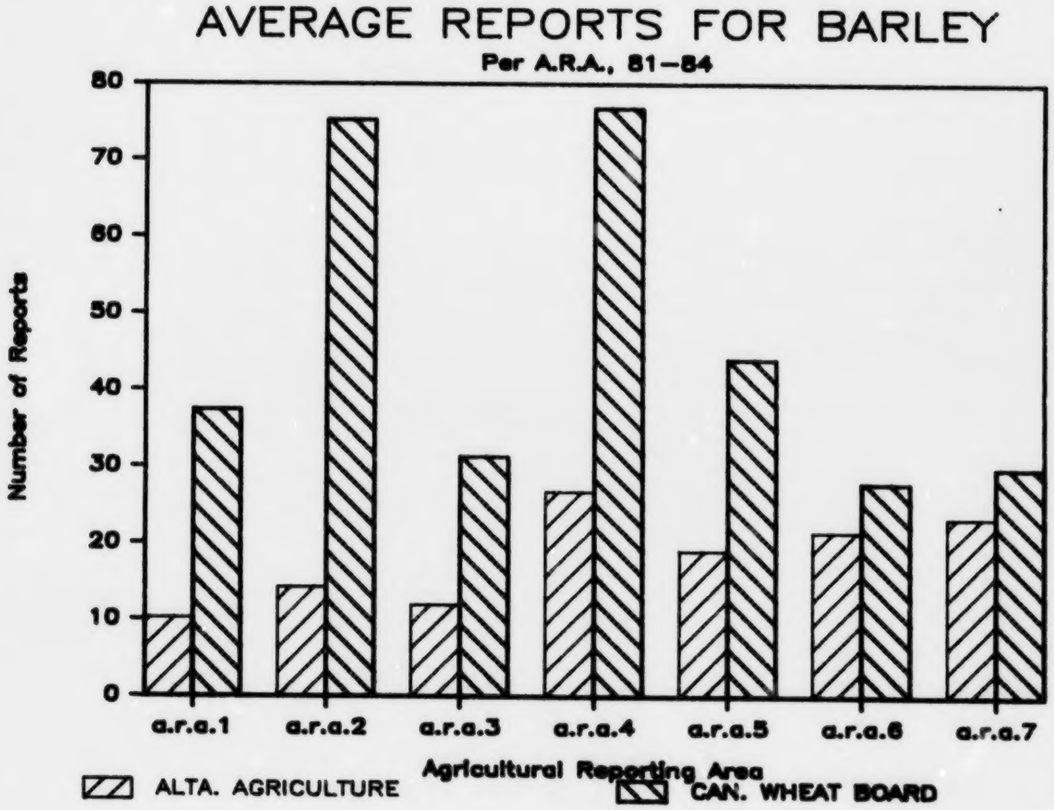
AVERAGE YIELDS FOR BARLEY

Per A.R.A., 81–84



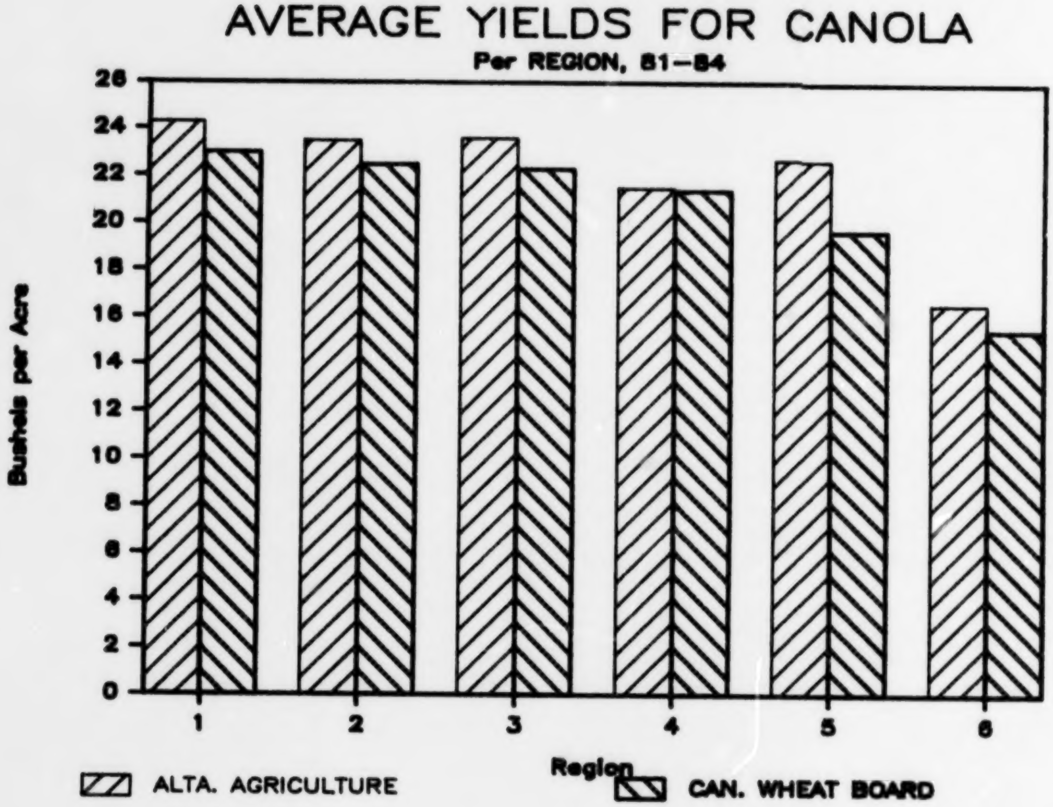
AVERAGE C.V. FOR BARLEY

Per A.R.A., 81–84

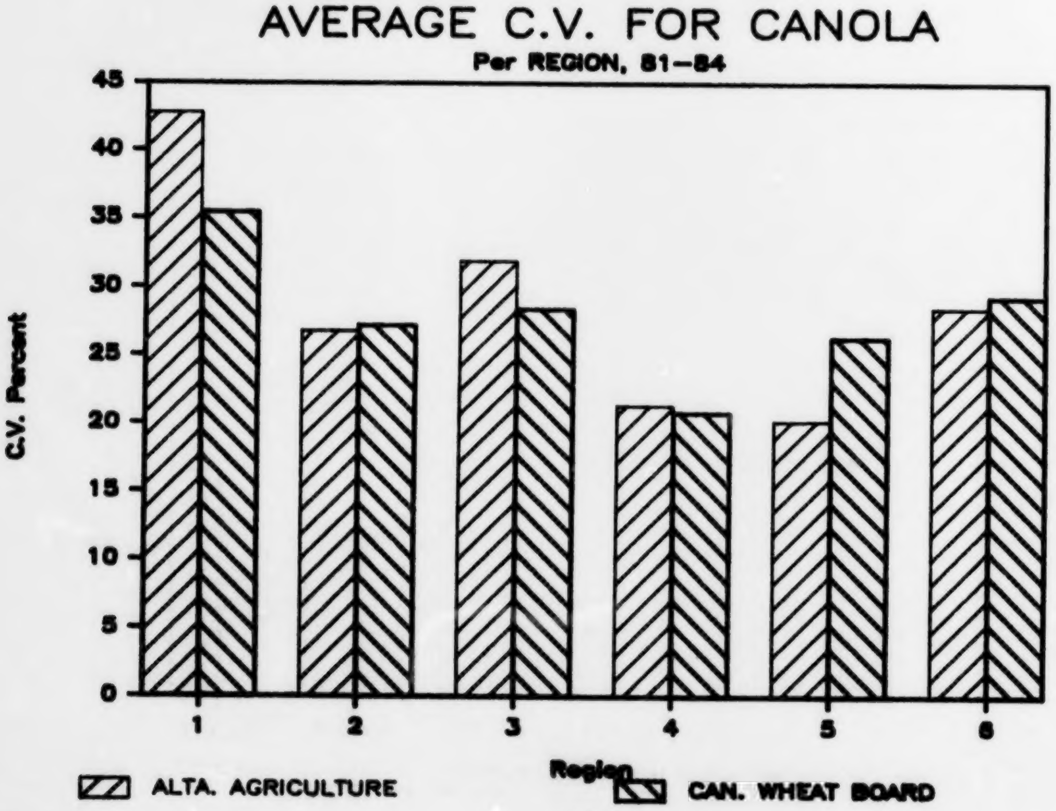


AVERAGE REPORTS FOR BARLEY

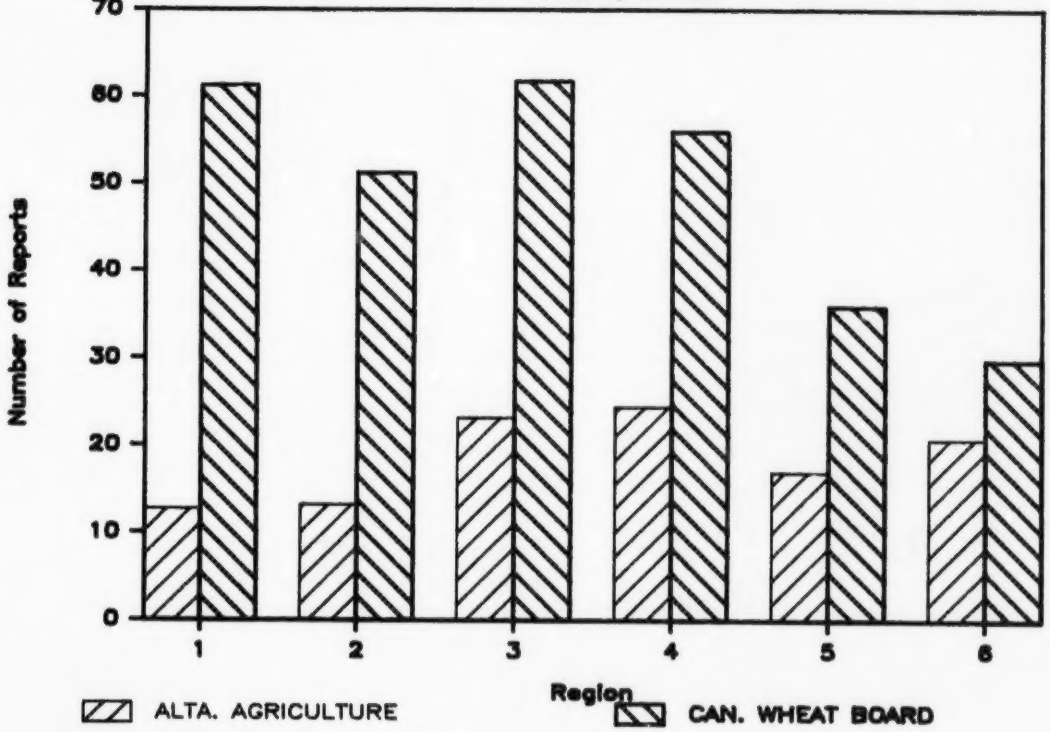
Per A.R.A., 81–84


AVERAGE YIELDS FOR CANOLA

Per REGION, 81–84

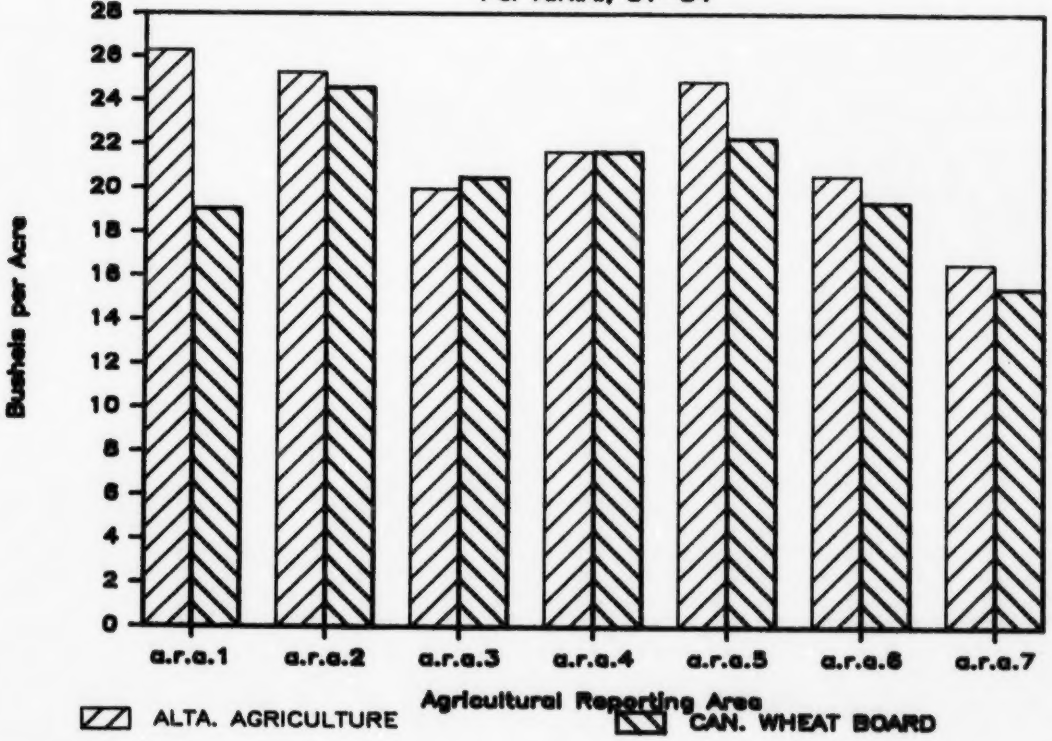

AVERAGE C.V. FOR CANOLA

Per REGION, 81–84



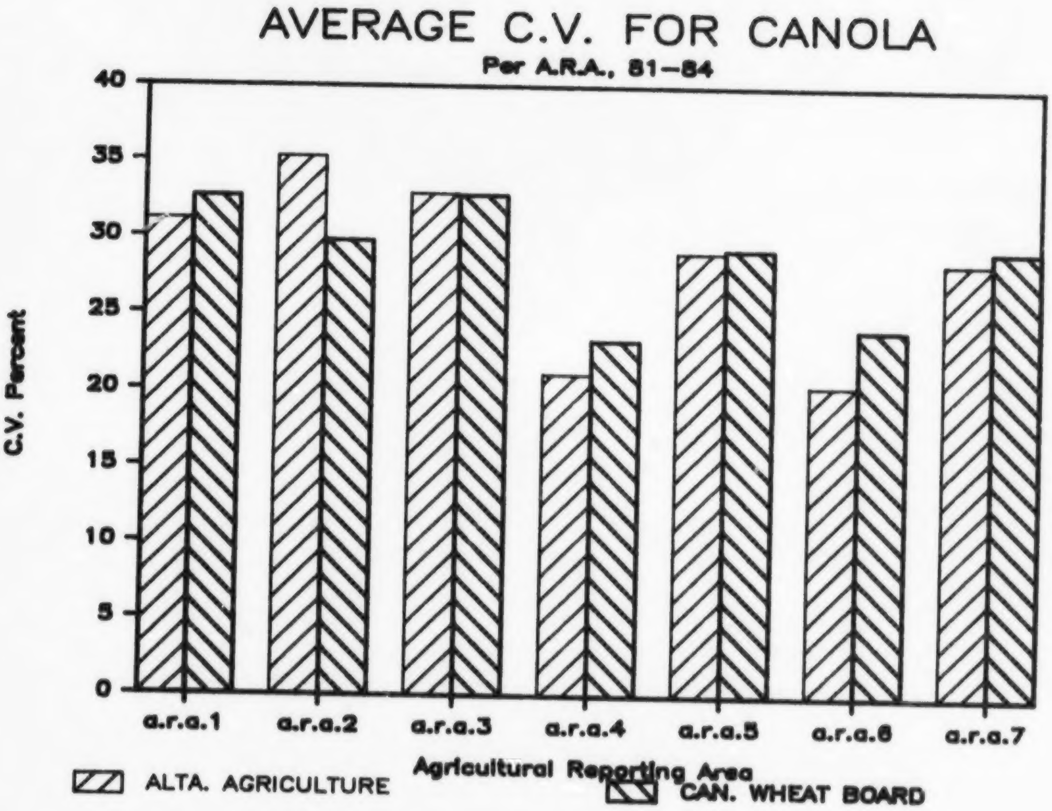
AVERAGE REPORTS FOR CANOLA

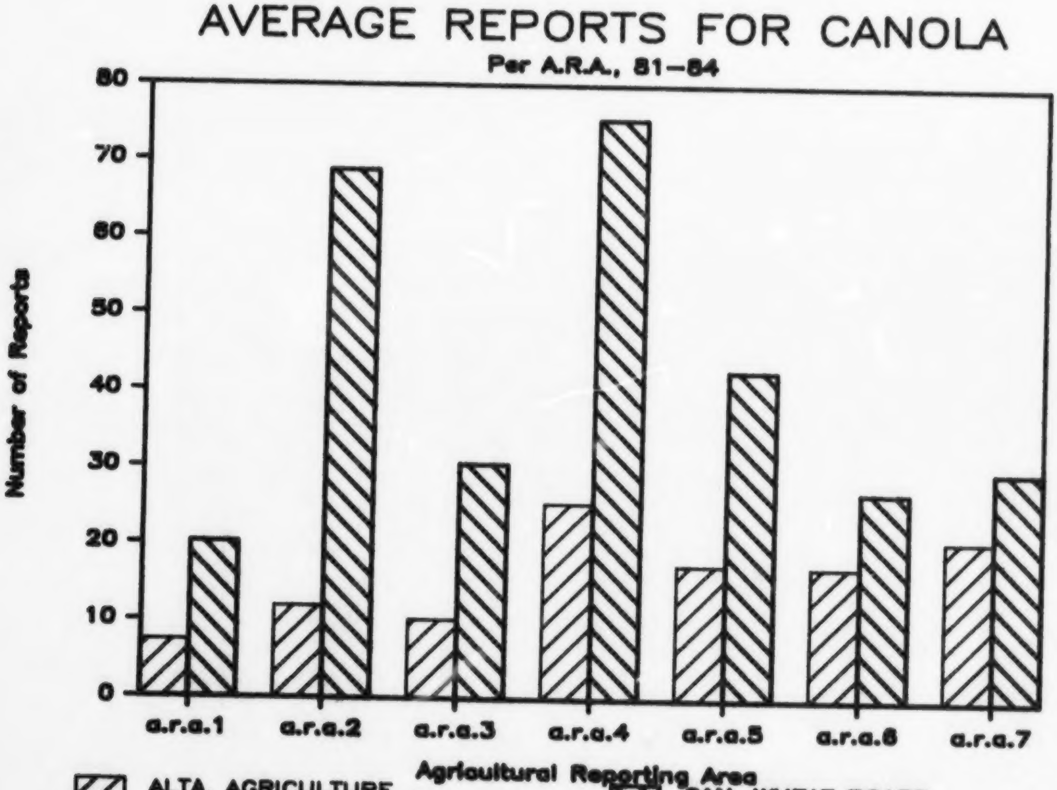
Per REGION, 81–84



AVERAGE YIELDS FOR CANOLA

Per A.R.A., 81–84


AVERAGE C.V. FOR CANOLA
Per A.R.A., 81–84
C.V. Percent
0
5
10
15
20
25
30
35
40
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area
▨ ALTA. AGRICULTURE
▧ CAN. WHEAT BOARD

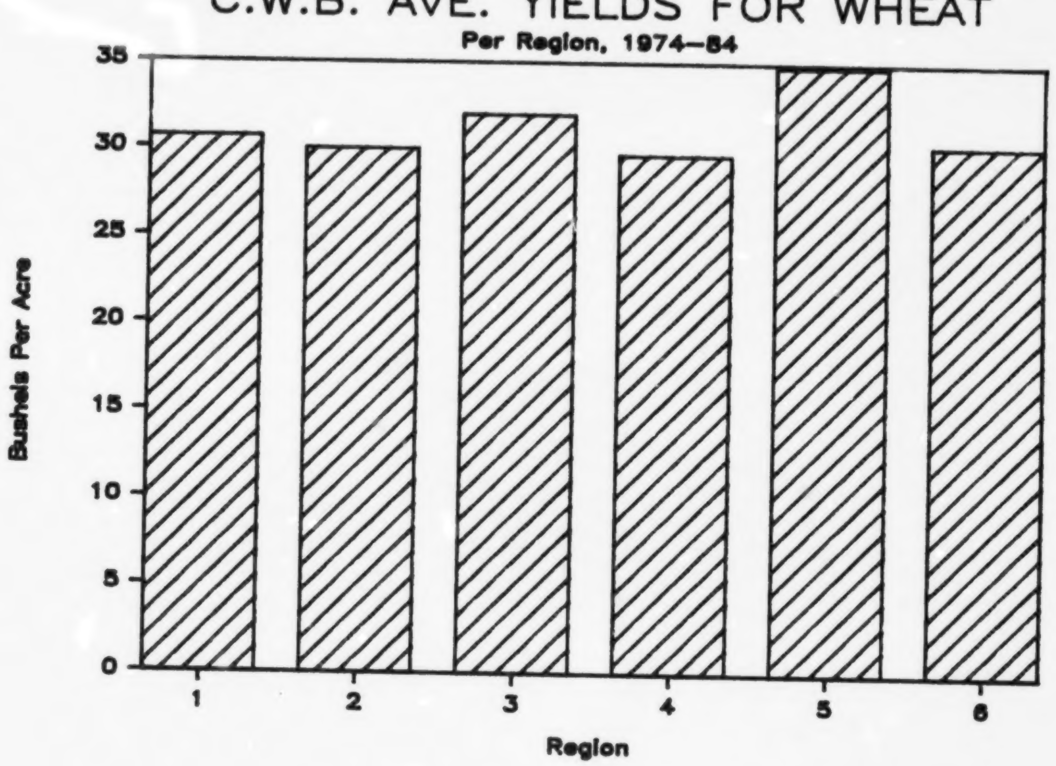

AVERAGE REPORTS FOR CANOLA
Per A.R.A., 81–84
Number of Reports
0
10
20
30
40
50
60
70
80
a.r.a.1
a.r.a.2
a.r.a.3
a.r.a.4
a.r.a.5
a.r.a.6
a.r.a.7
Agricultural Reporting Area
▨ ALTA. AGRICULTURE
▧ CAN. WHEAT BOARD

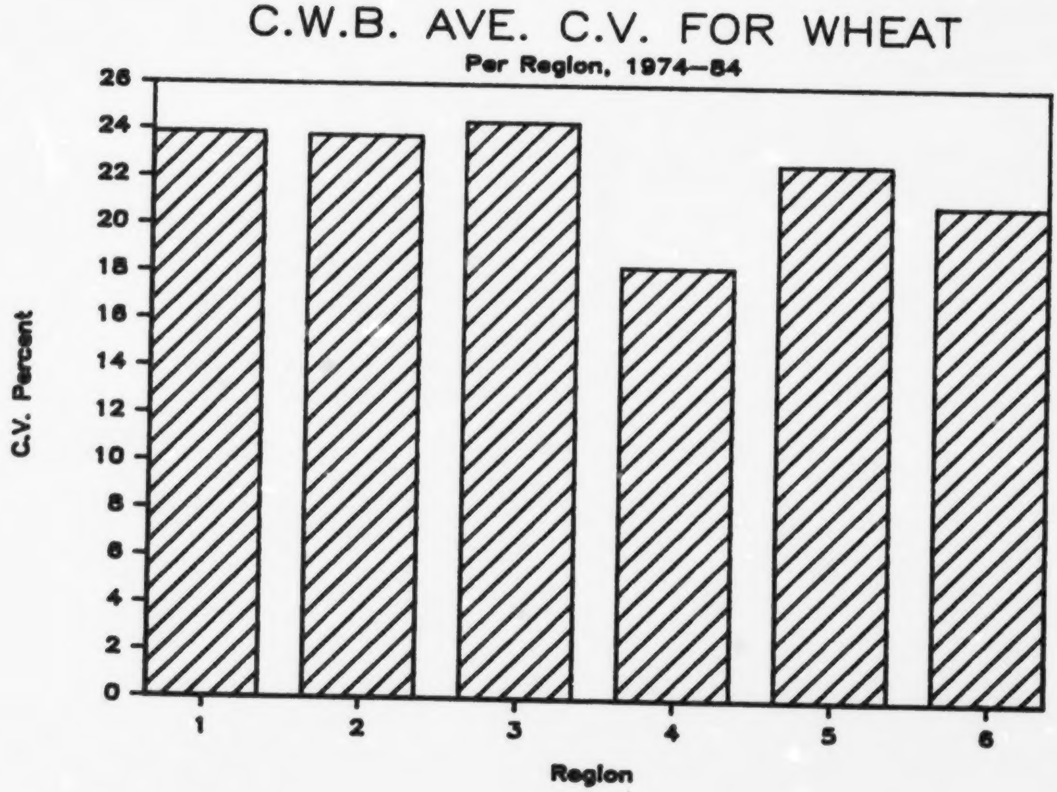
V. 11-Year Average Yield, CV and Number of Reports, Based on CWB Data, 1974 - 1984, by Region

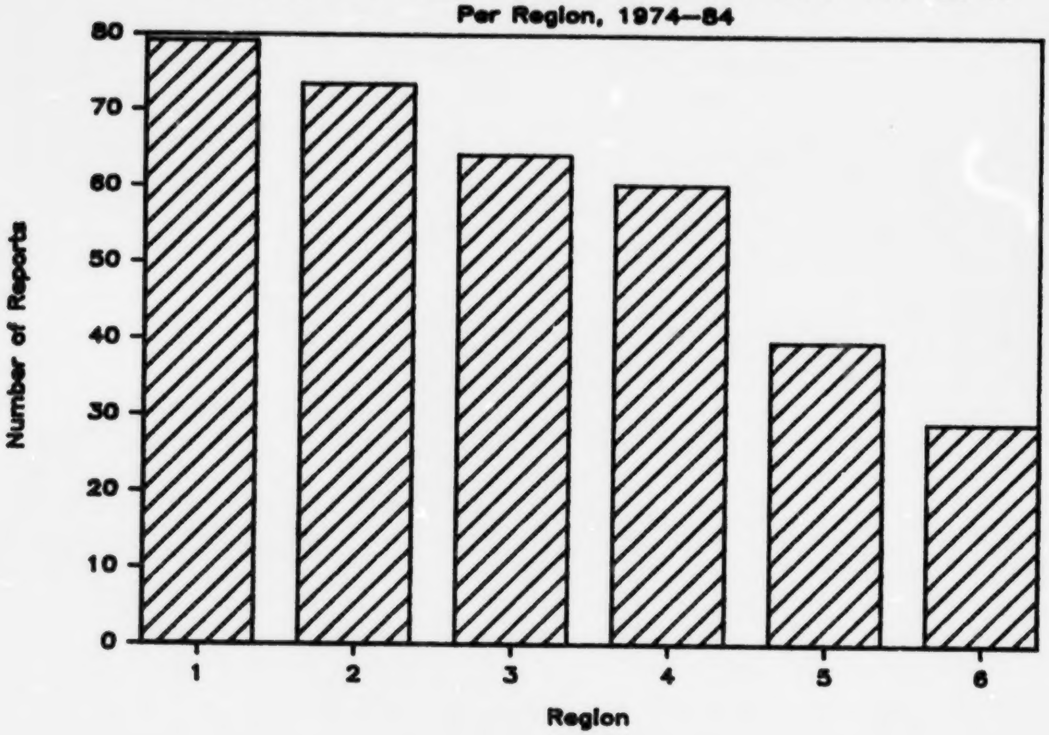
Section V Highlights

Section V provides 11 average yields based on data collected by the CWB between 1974-84. As well, the CV and sample sizes are provided.

According to the averages calculated, Region 5 generally has the highest wheat and oats yields. Barley yields in Region 1 are slightly higher than in Region 5. Rye yields are highest in Region 2. Canola and flaxseed yields are generally highest in Regions 1 and 3. The CVs are generally around 25 - 30% for the flaxseed, canola and rye estimates. This is due to both small sample sizes and a high variability in yields within the Region. The CVs for wheat, oats and barley are generally better, usually just over 20%. This could imply more consistent yields within the Region and/or a larger, more representative data sample.

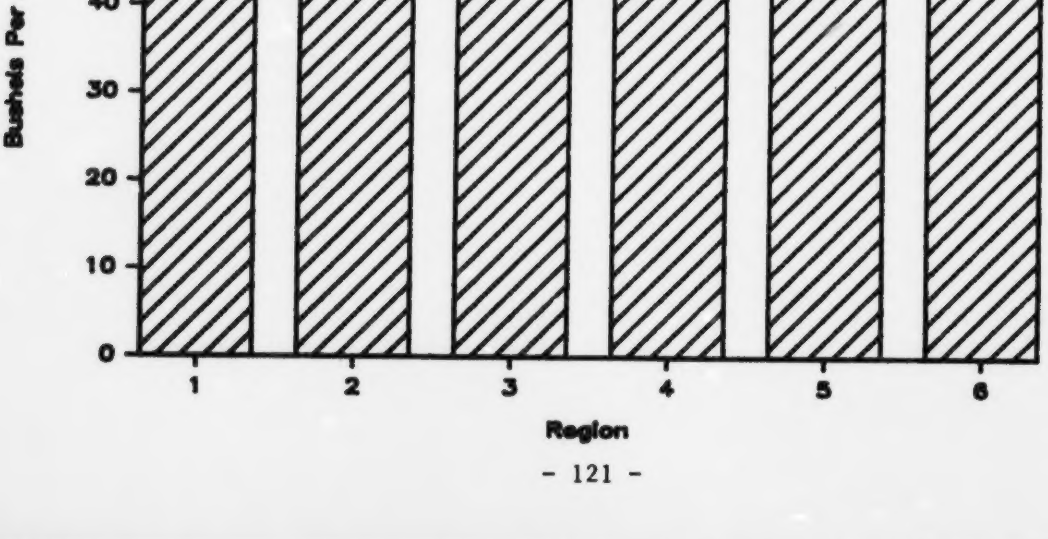

C.W.B. AVE. YIELDS FOR WHEAT
Per Region, 1974–84
Bushels Per Acre
0
5
10
15
20
25
30
35
1
2
3
4
5
6
Region


C.W.B. AVE. C.V. FOR WHEAT
Per Region, 1974–84
C.V. Percent
0
2
4
6
8
10
12
14
16
18
20
22
24
26
1
2
3
4
5
6
Region



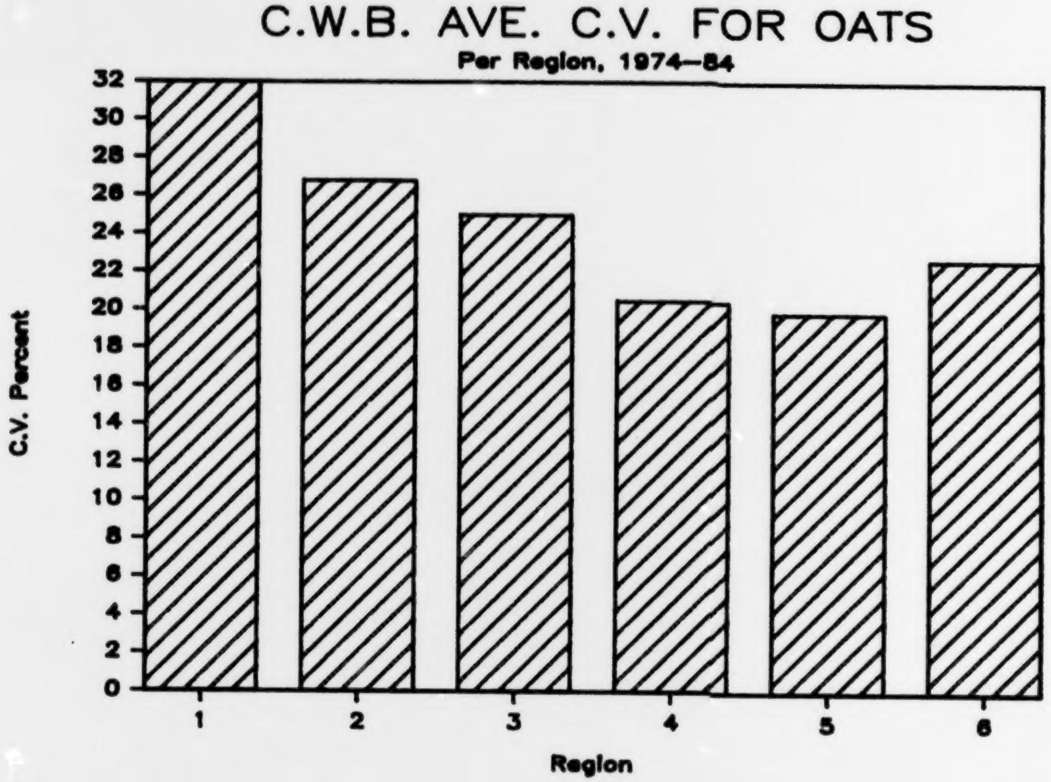
C.W.B. AVE. REPORTS FOR WHEAT

Per Region, 1974–84

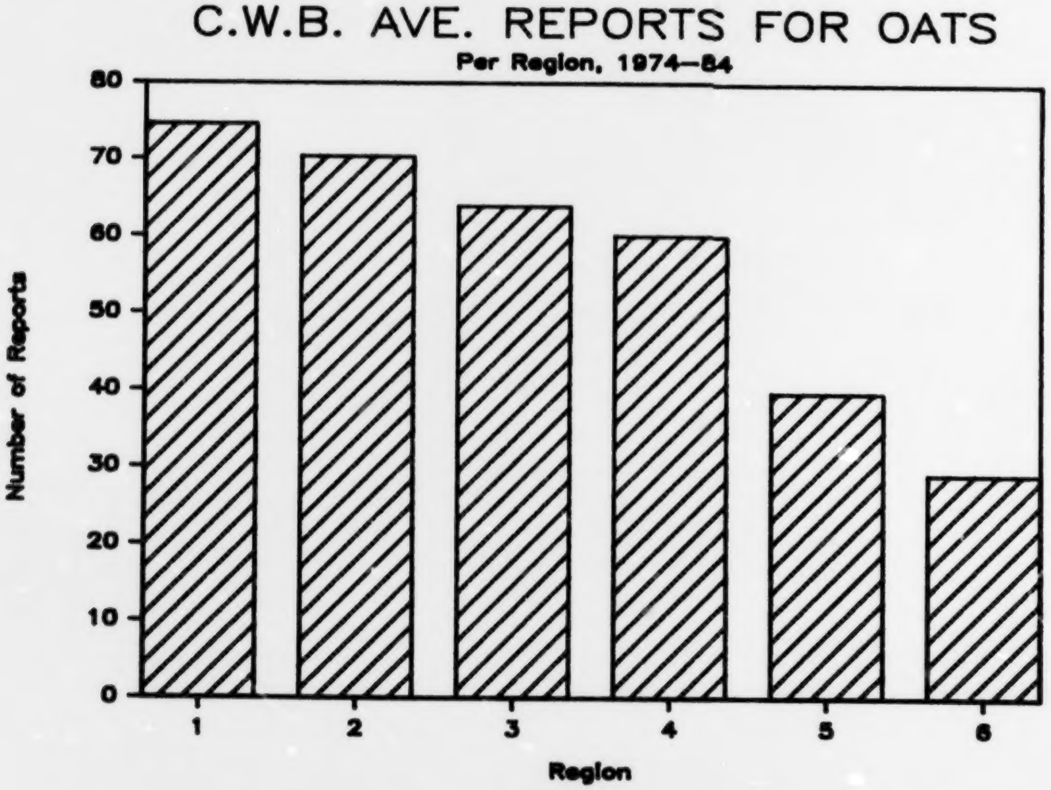


C.W.B. AVE. YIELDS FOR OATS

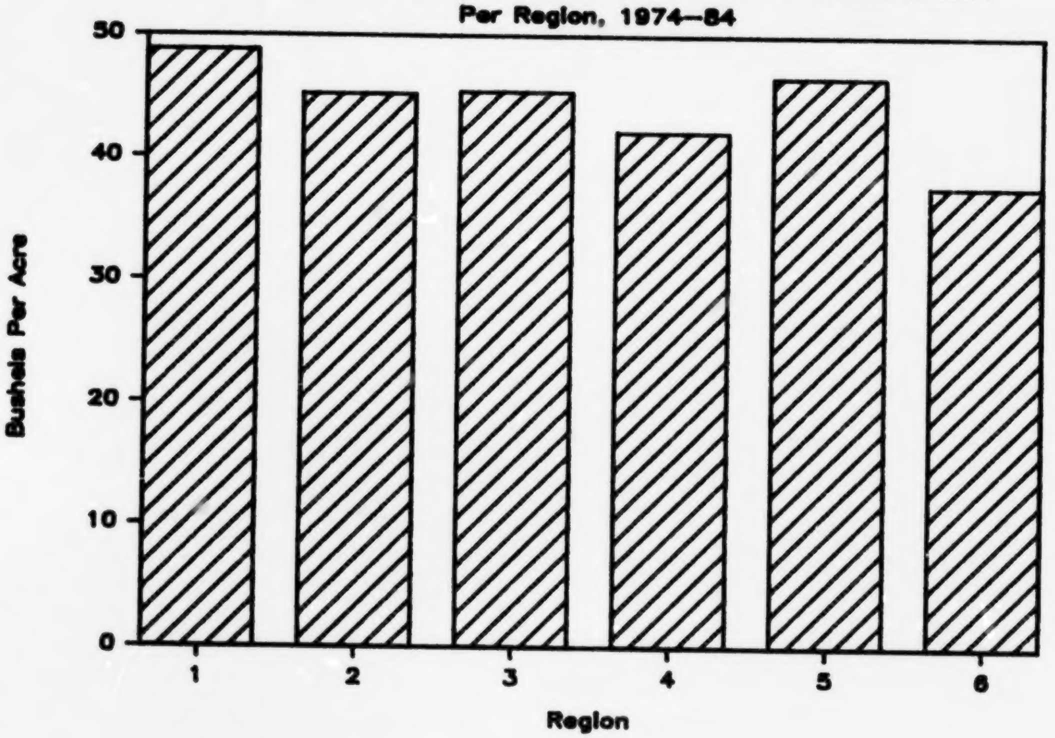
Per Region, 1974–84


C.W.B. AVE. C.V. FOR OATS

Per Region, 1974–84

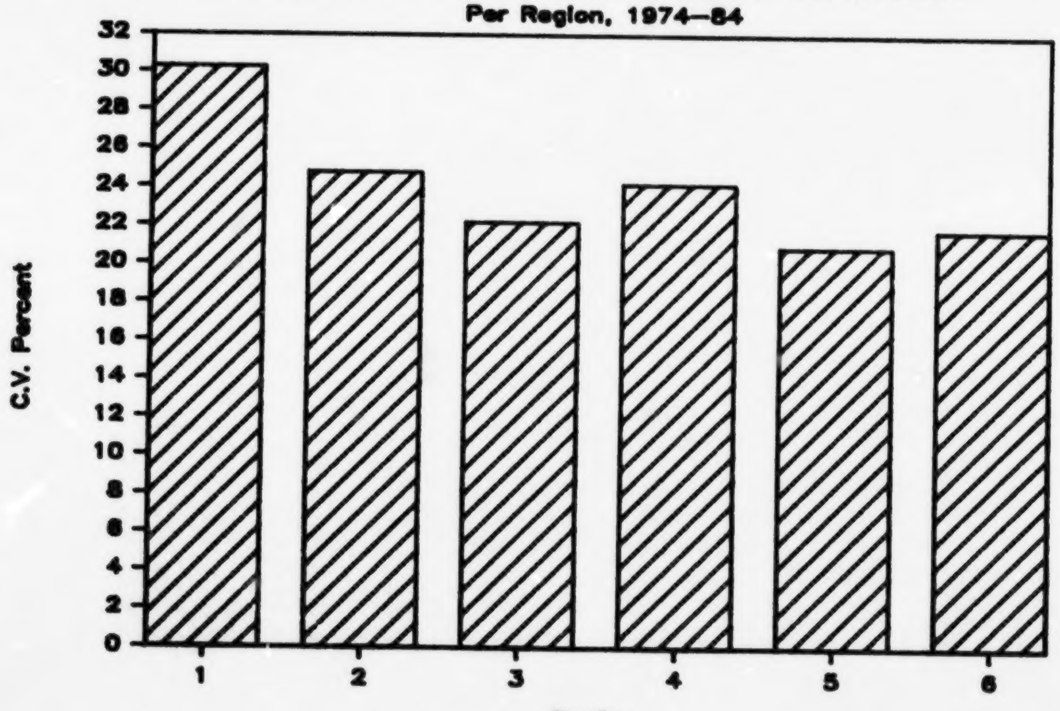

C.W.B. AVE. REPORTS FOR OATS

Per Region, 1974–84



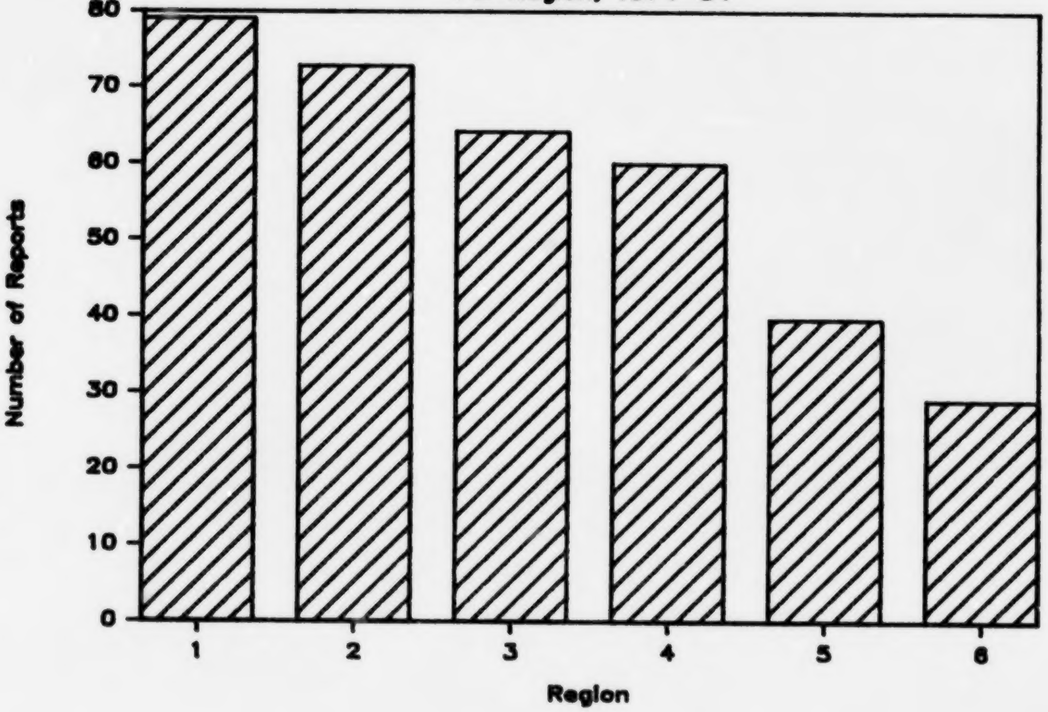
C.W.B. AVE. YIELDS FOR BARLEY

Per Region, 1974–84

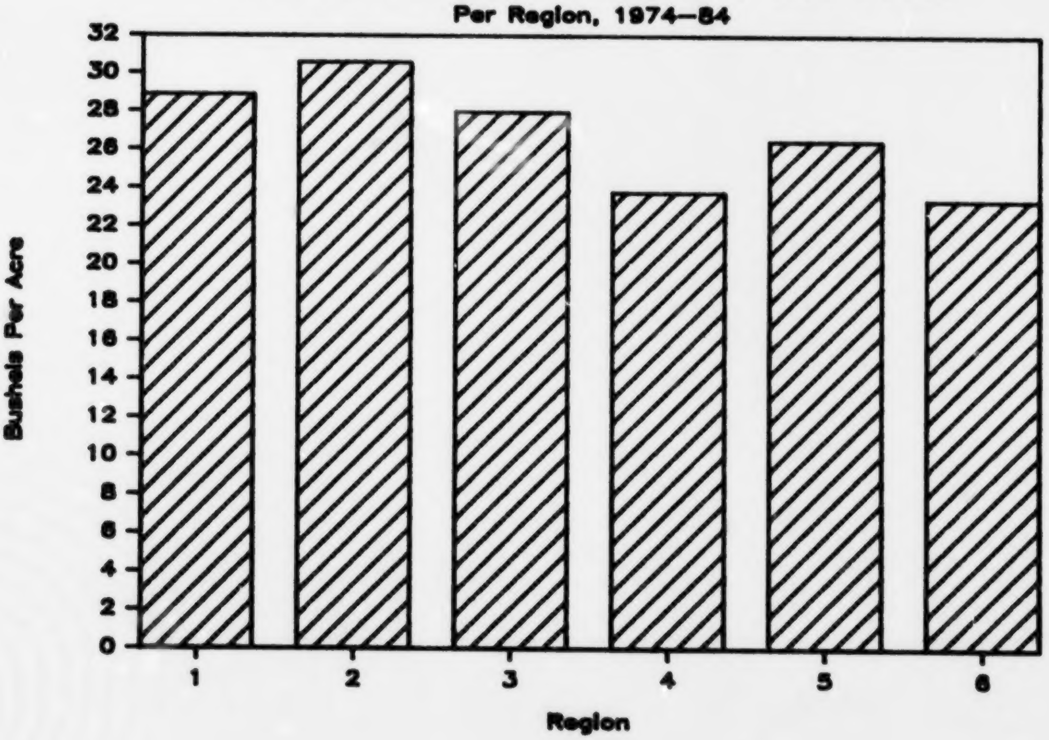


C.W.B. AVE. C.V. FOR BARLEY

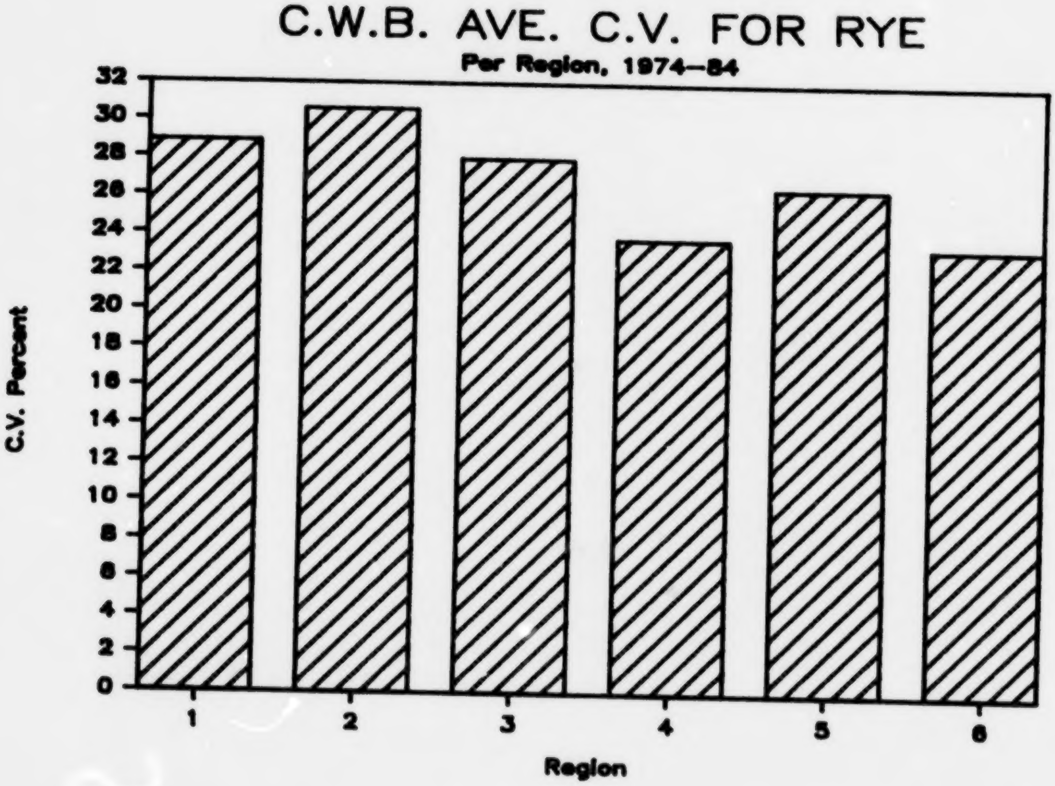
Per Region, 1974–84

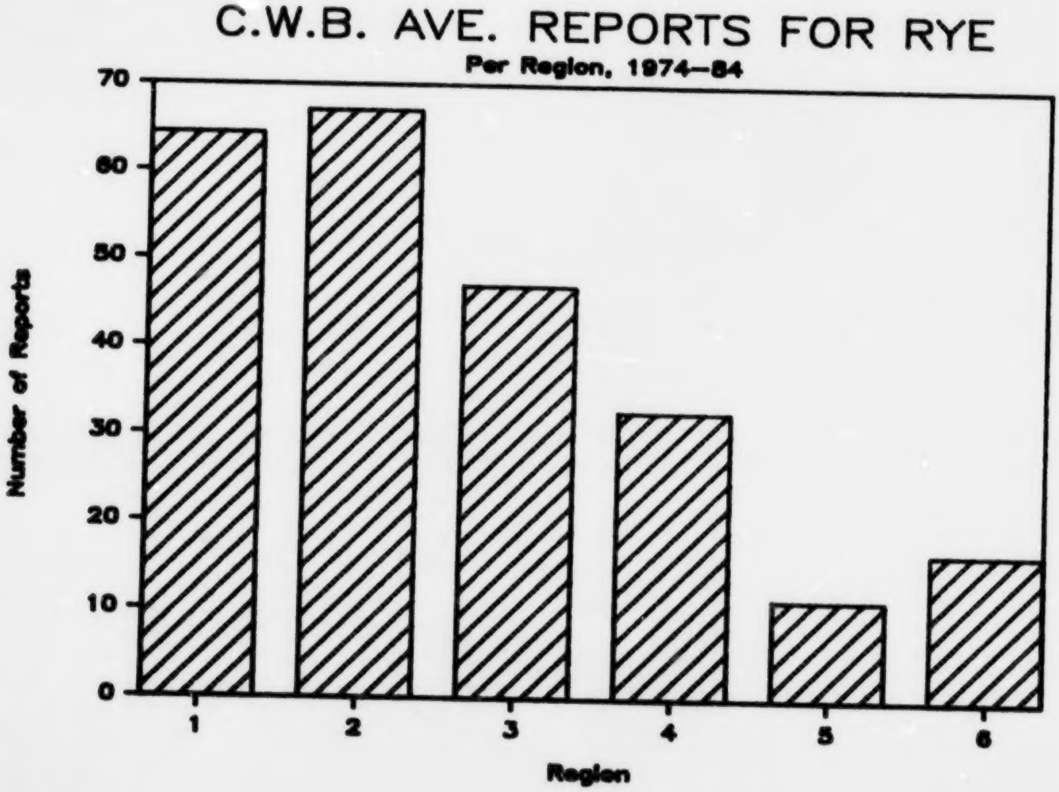

C.W.B. AVE. REPORTS FOR BARLEY

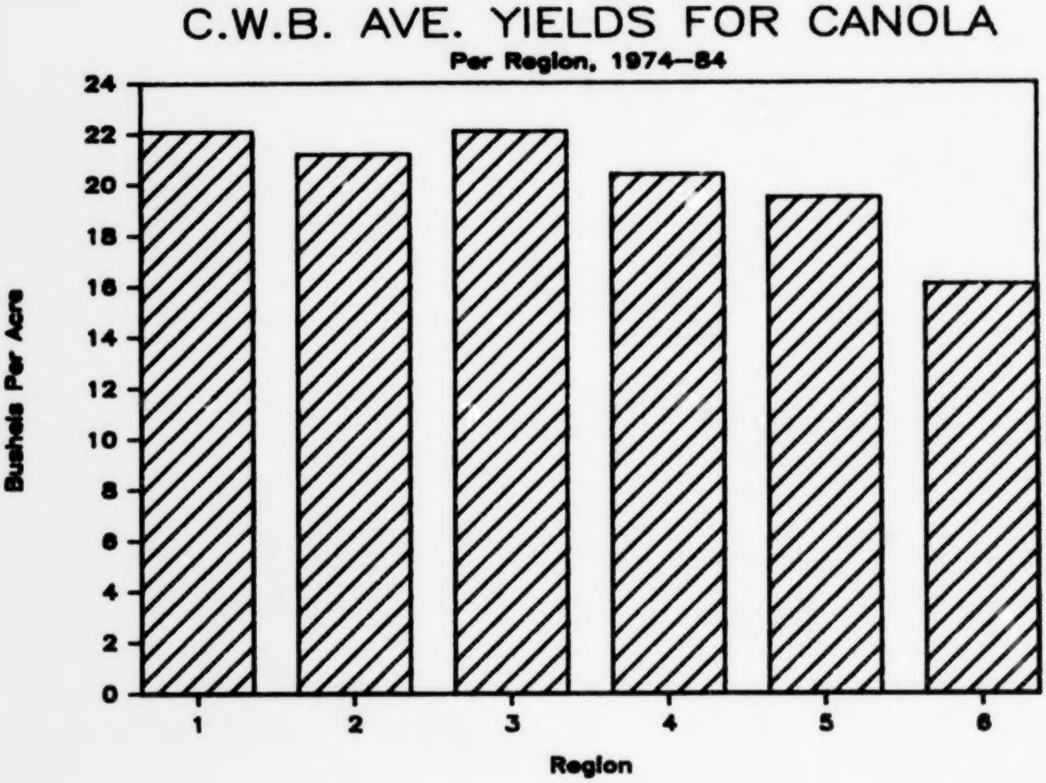
Per Region, 1974–84

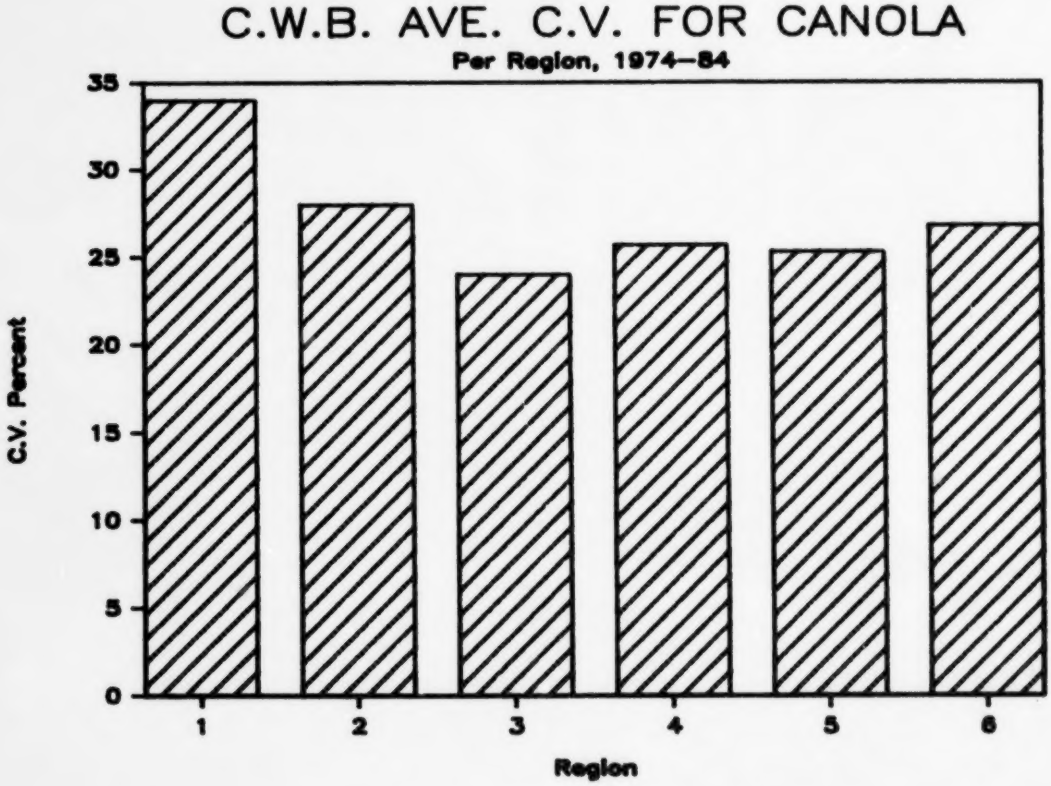

C.W.B. AVE. YIELDS FOR RYE

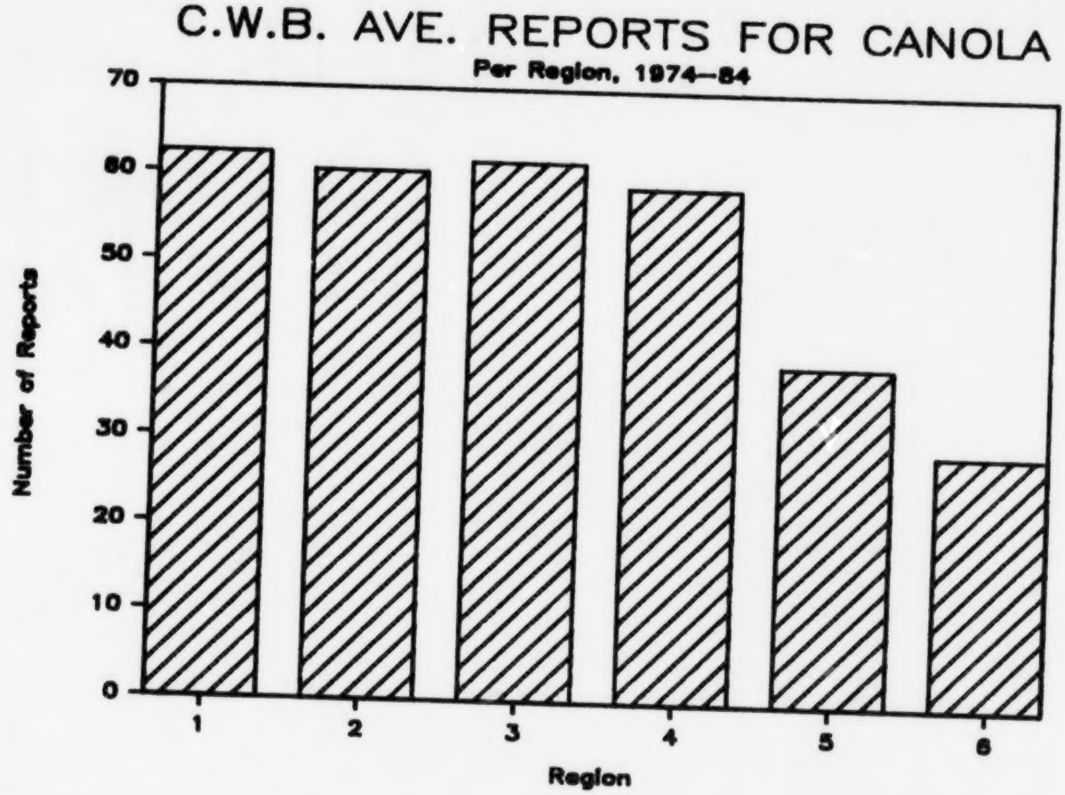
Per Region, 1974–84


C.W.B. AVE. C.V. FOR RYE
Per Region, 1974–84
C.V. Percent
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
1
2
3
4
5
6
Region


C.W.B. AVE. REPORTS FOR RYE
Per Region, 1974–84
Number of Reports
0
10
20
30
40
50
60
70
1
2
3
4
5
6
Region

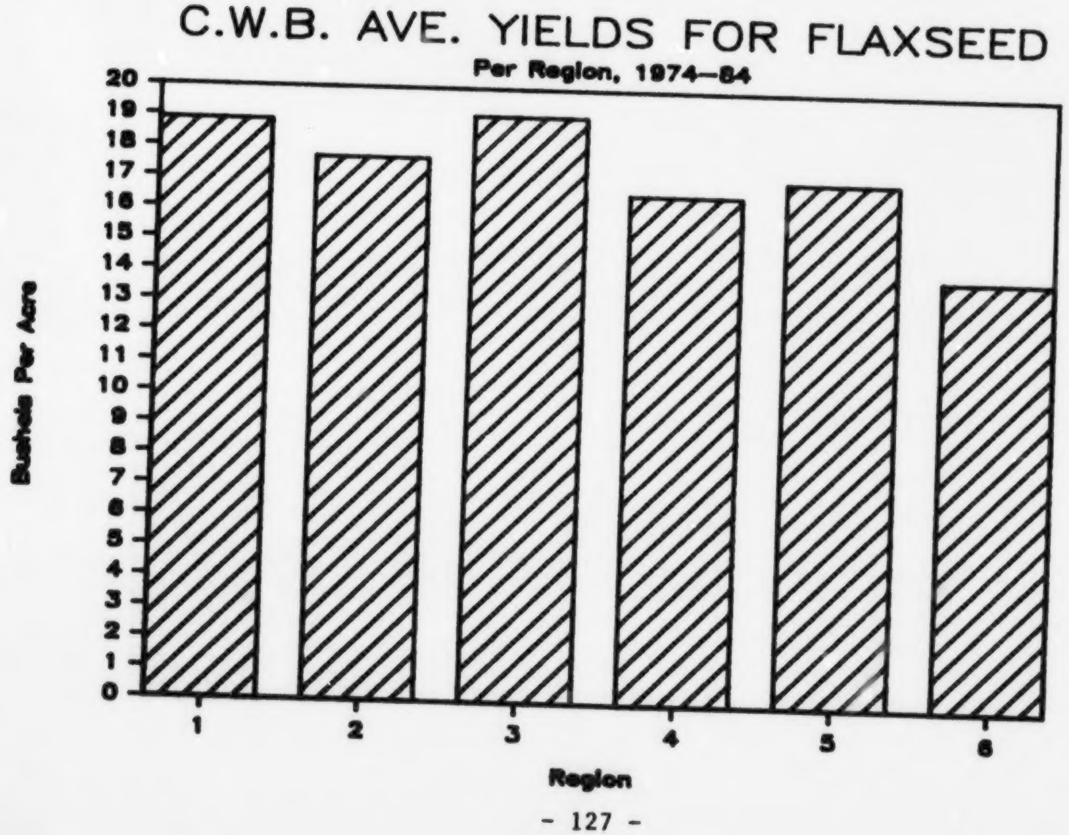

C.W.B. AVE. YIELDS FOR CANOLA
Per Region, 1974–84
Bushels Per Acre
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
3
4
5
6
Region


C.W.B. AVE. C.V. FOR CANOLA
Per Region, 1974–84
C.V. Percent
35
30
25
20
15
10
5
0
1
2
3
4
5
6
Region



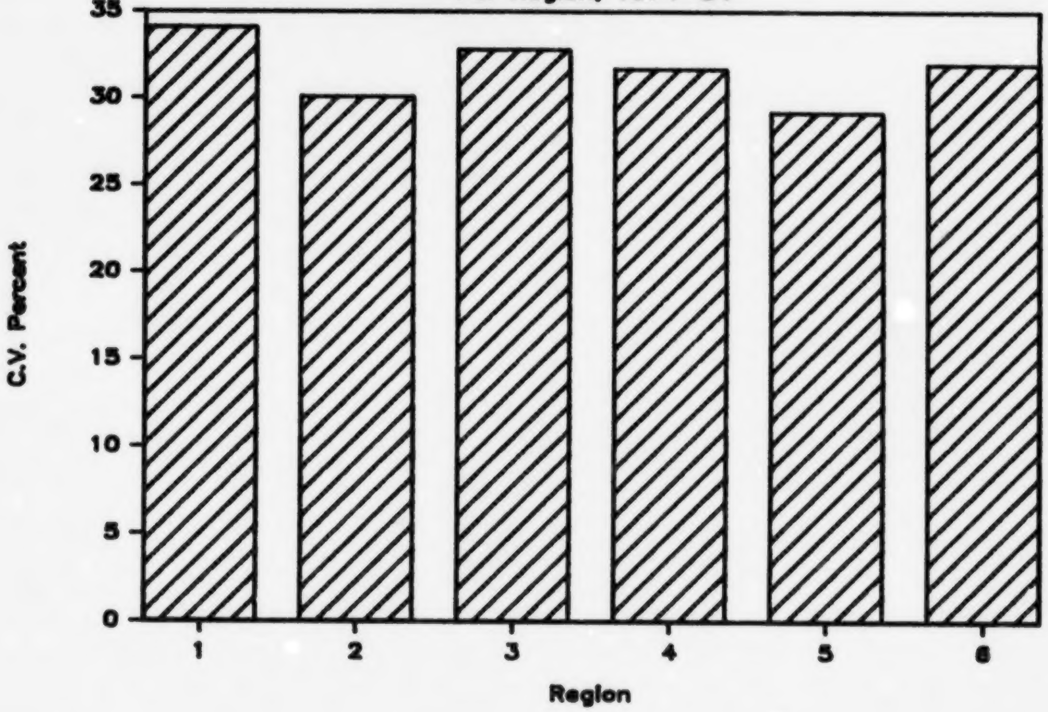
C.W.B. AVE. REPORTS FOR CANOLA

Per Region, 1974–84



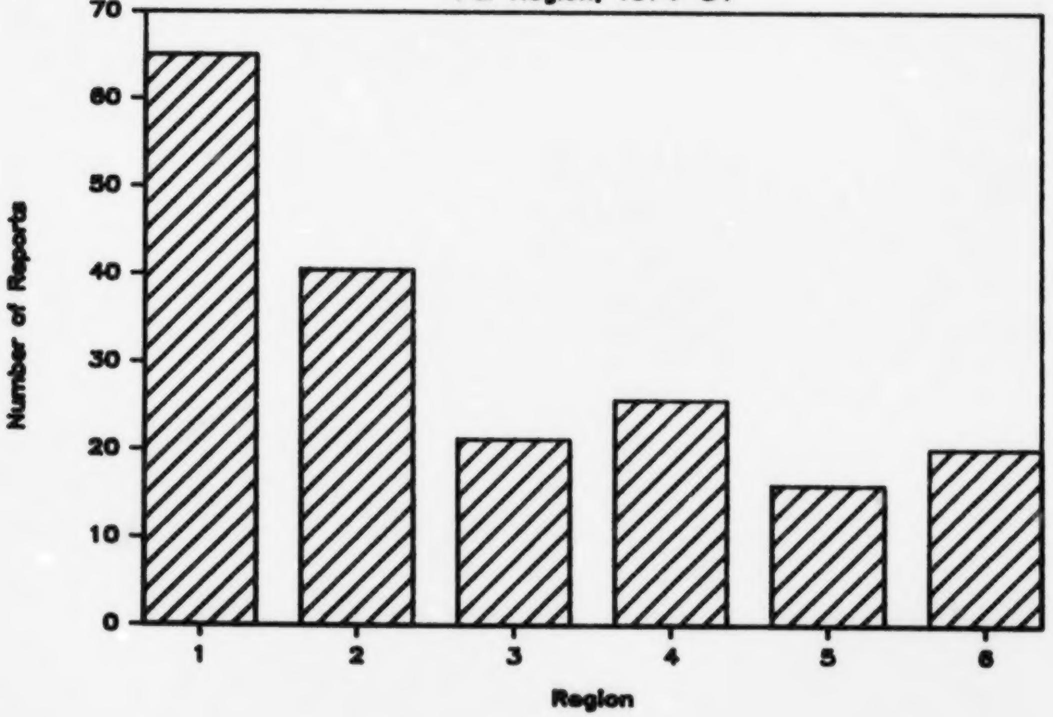
C.W.B. AVE. YIELDS FOR FLAXSEED

Per Region, 1974–84



C.W.B. AVE. C.V. FOR FLAXSEED

Per Region, 1974–84



C.W.B. AVE. REPORTS FOR FLAXSEED

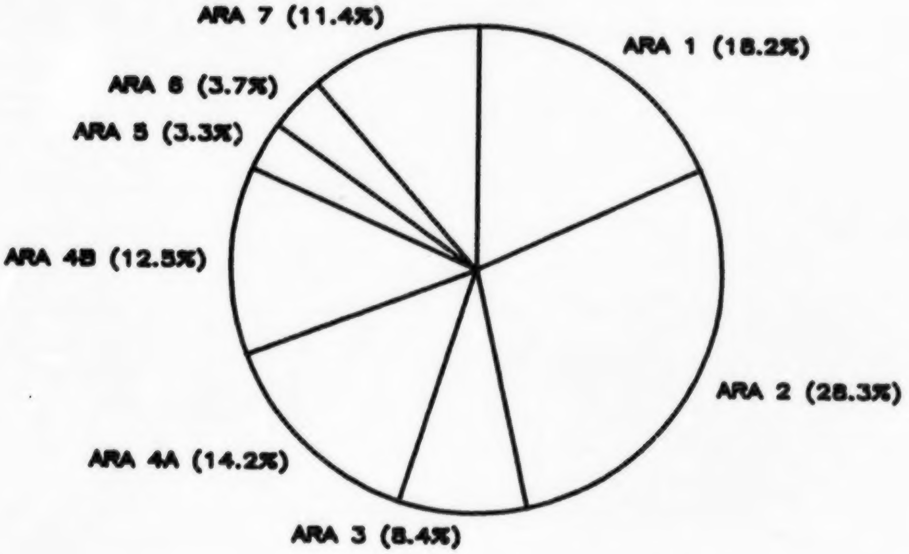
Per Region, 1974–84

APPENDIX I

Distribution of Crop Acreages in Alberta

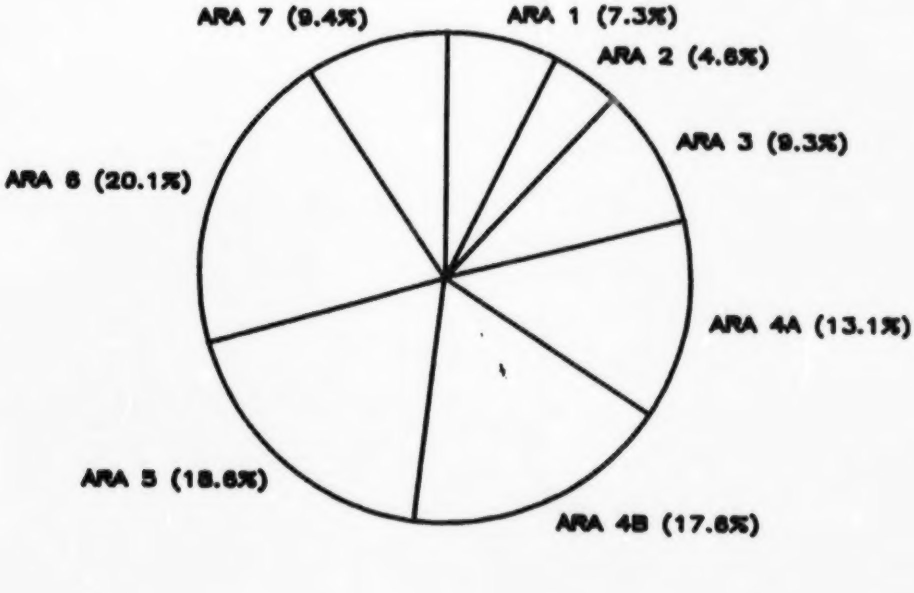
DISTRIBUTION OF WHEAT ACREAGE

ALBERTA, 5-Year Average by ARA



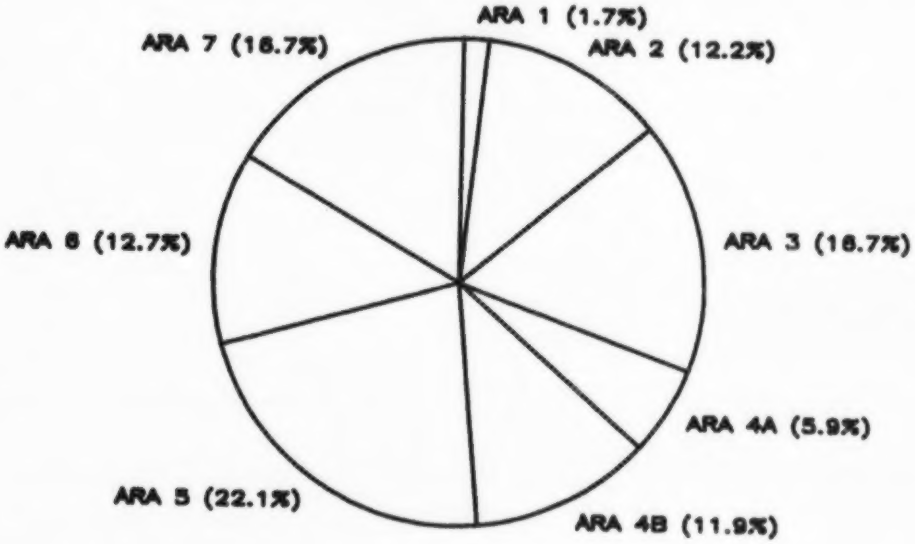
DISTRIBUTION OF OAT ACREAGE

ALBERTA, 5-Year Average by ARA



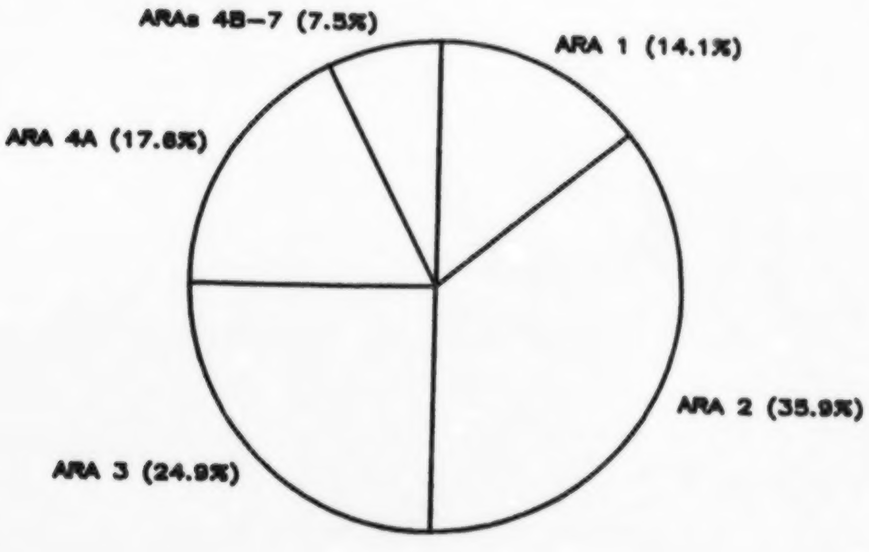
DISTRIBUTION OF BARLEY ACREAGE

ALBERTA, 5-Year Average by ARA



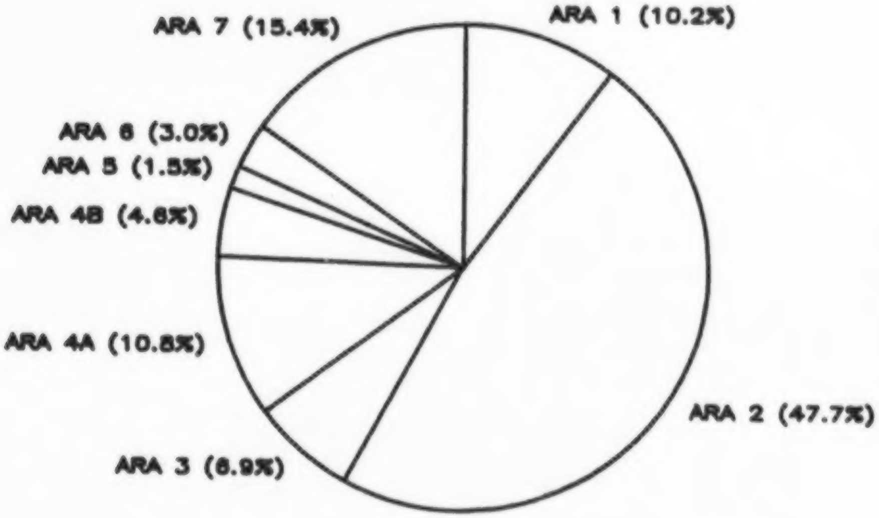
DISTRIBUTION OF RYE ACREAGE

ALBERTA, 5-Year Average by ARA



DISTRIBUTION OF FLAXSEED ACREAGE

ALBERTA, 5–Year Average by ARA



DISTRIBUTION OF CANOLA ACREAGE

ALBERTA, 5–Year Average by ARA